Website: http://www.jcmglobal.com

VEGA-RC Twin™ Series

Banknote Recycler

Operation and Maintenance Manual

(Revision 2)

P/N 960-000171R_Rev. 2 {EDP #217860}

a RoHS Compliant Product

Issue #4094-SME-01-02

Issue #4094-SME-01-02

REVISION HISTORY			
Rev №.	**Date**	**Reason for Update**	**Comment**
A	10-30-13	**Initial Version**	
1	6-15-15	**Added Vehicle Specification, Updated Parts Lists**	
2	3-23-16	**Updated Parts Lists**	

International Compliance

- RoHS Directives or or or or
- UL & c-UL Marks **File No. E142330, Subscriber 857947001, Vol.2**
- CE Mark
- CB Scheme **No78539**
- FCC Directives

FCC WARNING
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC NOTICE
This equipment has been tested and found to comply with the limits for a Class "A" Digital Device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

IC NOTICE
This Class "A" Digital Apparatus complies with Canadian ICES-003.
Cet appareil numerique de la Classe "A" est conforme a la norme NMB-003 du Canada.

Electrical Current Symbol

Direct Current: ⎓ indicates Direct Current values on product labels.

VEGA-RC Twin™ Series
Banknote Recycler
Table of Contents

Table of Contents

Table of Contents

Table of Contents

VEGA-RC Twin™ Series
Banknote Recycler
List of Figures

List of Figures

List of Figures

THIS PAGE INTENTIONALLY LEFT BLANK

VEGA-RC Twin™ Series
Banknote Recycler
List of Tables

THIS PAGE INTENTIONALLY LEFT BLANK

VEGA-RC Twin™ Series
Banknote Recycler
Section 1

1 GENERAL INFORMATION

Description

This section provides a general overview of the VEGA-RC Twin™ Series Banknote Recycler Unit, pictured in Figure 1-1. This section is designed to help the user navigate through this guide with ease. It includes the following information:

- VEGA-RC Twin Unit
- Model Description
- Precautions
- Primary Features
- Component Names
- Specifications
- System Configuration
- Unit Dimensions
- Technical Contact Information

The following conventions are used throughout this manual to simplify navigation and device operation:

- **Safety Instructions** need to be observed in order to protect the operators and the equipment; these are identified with **bold** text and the following pictographs:
- **Special *Notes*** affect the use of the Banknote Recycler; these are identified with *italic* text and the following pictograph:
- **Steps** require the operator to perform specific actions; these are identified with sequential numbers (1, 2, 3, etc.)
-

VEGA-RC Twin Unit

Figure 1-1 VEGA-RC Twin Unit

Model Descriptions

Table 1-1 lists the product model number descriptions.

Table 1-1 VEGA-RC Twin Model Number Specifications

Nº	Model: VEGA-RC Twin-**-* Nº (1) (2)(3)
(1)	Product Series Name
(2)	Input Power Source 12 = 12V DC Power Source 42 = 24 - 36V DC Power Source [MDB Specification] (option)
(3)	Vehicle Installation 0 = Standard 1 = Vehicle Specification (Vibration Resistance)

Precautions

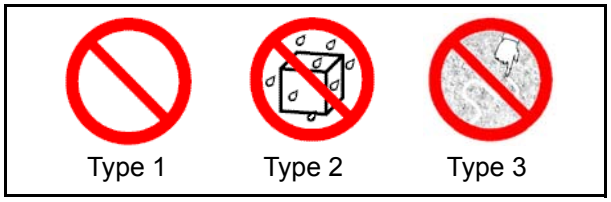


Figure 1-2 Precautionary Symbols

Symbols in Figure 1-2 are defined as follows:

1. (Type 1) Do not insert a torn, folded, or wet Banknote; it may cause a jam inside the unit.
2. (Type 2) Do not expose the unit to water. The unit contains several precision electronic devices that can be damaged if water or any liquid is sprayed or spilled into the unit.
3. (Type 3) Do not install the unit in a dusty environment. Dust may affect/degrade the sensor's performance.

User Cautions

Careful measures were taken in the design of this product to ensure its quality; however, the following cautions pertain to all users and should be followed for safe operation.

Installation Cautions

The Installation Cautions are defined as follows:

1. Do not allow the unit to endure or operate at a high temperature, in high humidity and/or dusty environment.
2. Do not install the unit in an area with excessive vibration or shock present.
3. Be sure that the host machine contains enough protection to avoid wet or dusty conditions when installing it in either an indoor or open-air space. This unit is not designed for outdoor installations.
4. Avoid exposing the unit to direct sunlight/incandescent lamp illumination with a gradient angle of 15 degrees or more, and an illumination index of 3,000 Lux or less.
5. Ensure that the host machine is designed for daily operational access for maintenance and/or clearing a Banknote Jam.

Mounting, Dismounting & Transportation

Methods for mounting, dismounting and transporting the unit:

1. Be sure to turn the VEGA Unit's power OFF before mounting or removing the Recycler unit.
2. Plugging or unplugging the Recycler's communications connector while the VEGA Unit's power is ON may cause damage to the Recycler unit.
3. When reassembling a disassembled section, ensure that each part is carefully placed in its proper location.
4. Be sure to carry the unit using both hands. Holding the unit with only one hand may cause personal injury (if the unit comes apart).
5. While transporting, be careful not to apply too much pressure to the unit, or subject it to excess vibration.
6. Do not throw or apply excessive force to the unit.

Preventive Maintenance

The preventive maintenance requirements are defined as follows:

Caution: Turn the VEGA Unit's power supply OFF before opening the Rear Cover; otherwise, the rollers could begin operating and cause injury by pulling fingers into the unit.
Be careful to avoid any personal injury to fingers when closing the Rear Cover of the Recycler.

1. When closing the Rear Cover of the Recycler, ensure that it clicks firmly into place
2. Use a soft, lint-free cloth, cotton swab or compressed air spray to clean dust and debris from the Rollers.
3. Perform routine cleaning and maintenance at least once a month to keep the VEGA Recycler Unit's performance stable.
4. Be sure that the Guides and unit sections are placed in the proper location after a maintenance procedure.
5. Do not replace Banknotes by hand-winding them back into place; instead, use the unit's recycling action ONLY.
6. Do not redesign or disassemble the Recycler. Unauthorized use by inadequately trained personnel, or use outside the original manufacturer's intent, voids the warranty.

WARNING: DO NOT use a cleaning cloth wet enough to allow excess fluid to run into the device; internal printed circuit boards may be damaged.

WARNING: Do not inject water or any liquid agent into the Recycler; it may cause extreme damage.

Caution: Do not use alcohol, thinner, or citrus-based products for cleaning any surfaces or sensors. The lenses can become clouded by chemical evaporation residue, which can result in acceptance errors.

Banknote Fitness Requirements

The following Banknote types may not validate correctly, or worse, can cause a jam and/or damage to the unit's Transport Path.
Banknotes exhibiting the following conditions illustrated in Figure 1-3 should be avoided:

- torn
- excessive folds or wrinkles
- dirty
- wet
- containing foreign objects and/or oil

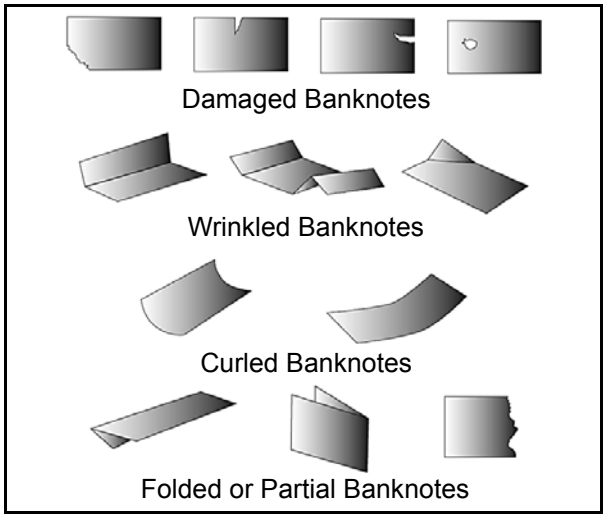


Figure 1-3 Unacceptable Banknotes

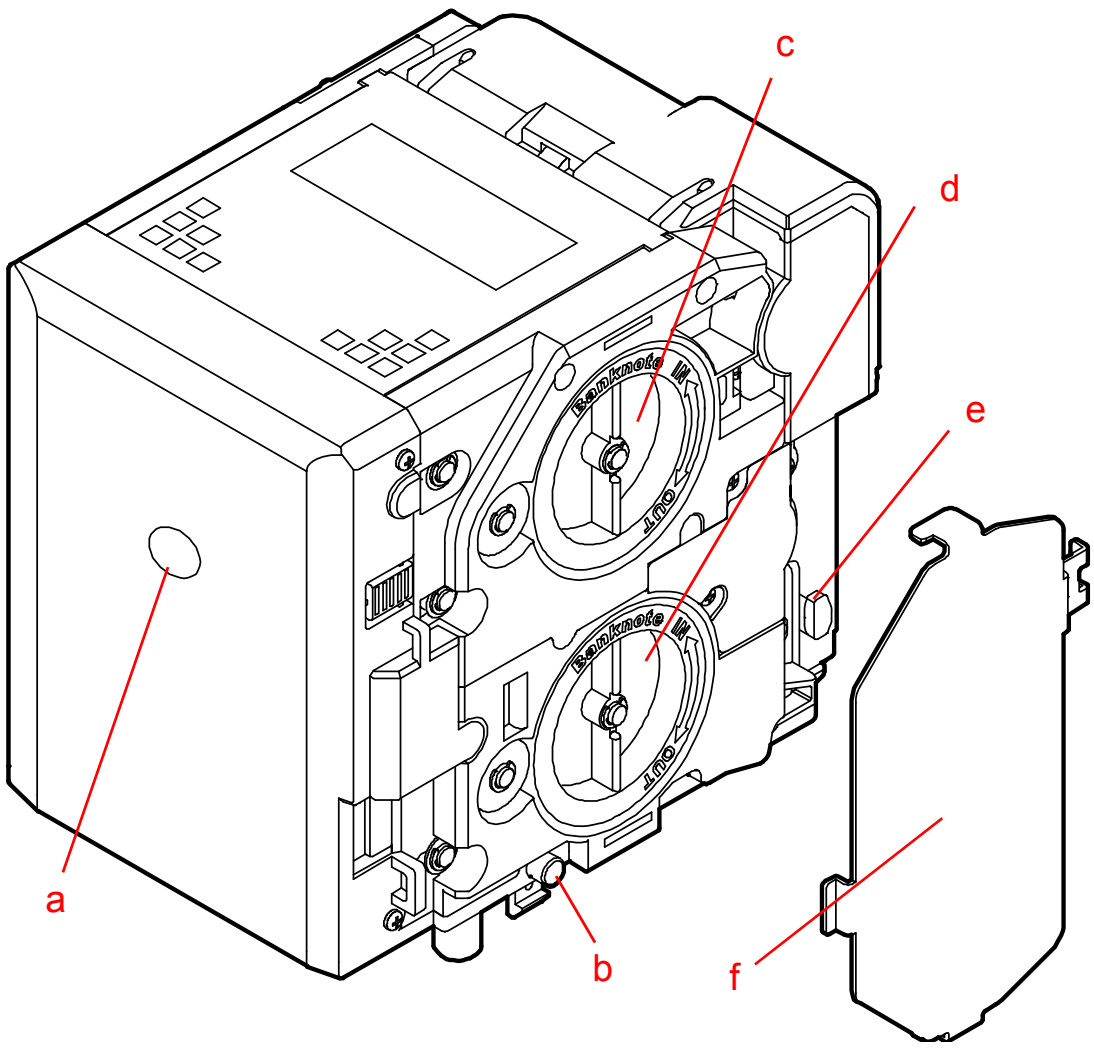
Primary Features

This VEGA-RC Twin Series, VEGA-RC Twin Banknote Recycler contains the following primary features:

- The VEGA-RC Twin is capable of recycling any two (2) denominations that the VEGA accepts. Each Recycler Drum can store up to 30 notes. The unit accepts most Banknotes worldwide.
- The specific design of the Banknote Winding System improves the overall process.
- The VEGA-RC Twin, the optional unit of the VEGA, features two (2) individual Recycler Drums available for two (2) Banknote denominations.

Component Names

Figure 1-4 illustrates the VEGA-RC Twin component names and locations.



a) Two Red/Green Multi-Color LED Indicators
b) VEGA Attach/Release Button
c) Upper Recycler Drum Handle Gear
d) Lower Recycler Drum Handle Gear
e) Rear Course Open, Close Button
f) Gear Cover

Figure 1-4 VEGA-RC Twin Component Names

Specifications

Technical Specifications

Table 1-2 VEGA-RC Twin Technical Specifications

Acceptance Denomination*:	Refer to the VEGA Unit's specific "Software Specification."
Banknote Types Accepted:	Long side: 110~160mm (4.33~6.3 in.) Short side: 60~82mm (2.36~3.23 in.)
Insertion Direction:	Banknote: Four-way
Processing Speed†:	With VEGA Unit • Approximately 5 seconds (from Banknote insertion to stacking completion) • Approximately 5 seconds (from Banknote insertion to next insertion enable) • Approximately 3 seconds (from Banknote dispense to eject completion) • Approximately 5 seconds (from receiving a retrieve command to Banknote retrieval)
Diagnostic Indicators:	Two Red/Green Multi-Color LEDs
Drum (Stacker) Capacity:	30 Notes x 2 (150mm new Banknote - e.g., 100 Euro Banknotes) Full detection. The number of stored notes can be set to maximum, or between 1 and 30 notes, No Nearly Full End detection
Stacking Method:	Banknote Winding System‡
Dispense:	No denomination discrimination No double note detection (e.g., condition is detected by the VEGA Unit) Note length discrimination (when denomination type is set)

*. Acceptable denomination can be selected. (Refer to "VEGA-RC Twin Software Information Sheet".)

†. Excluded host communication time lag.

‡. DO NOT replace Banknotes by hand-winding them back into place. Allow them to be replaced by the unit's recycling action only!

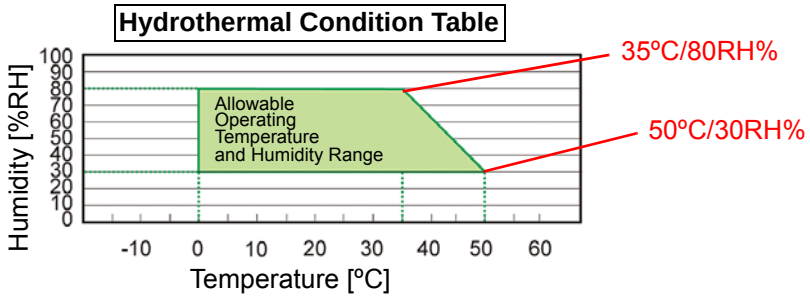
Environmental Specifications

Table 1-3 VEGA-RC Twin Environmental Specifications

Operating Temperature:	0ºC to +50ºC (32ºF to 122ºF)*
Storage Temperature:	-20ºC to +60ºC (-4ºF to 140ºF)*
Relative Operating Humidity:	30% to 80% RH (non-condensed)
Relative Storage Humidity:	10% to 85% RH (non-condensed)
Visible Light Sensitivity:	Avoid contact with direct sunlight (Interior lighting must be incandescent with a Radiant Angle of 15 Degrees or more having an Illumination index of 3000 Lux or less)
Installation:	Indoors Only†

*. Depends on hydrothermal conditions.

†. Do not expose to the elements (including internal parts of the unit).



Electrical Specifications

Table 1-4 VEGA-RC Twin Electrical Specifications

Supply Voltage*:	VEGA-RC Twin • 12V DC ±5% • 24-36V DC (Minimum: 20V DC/Maximum: 42.5V DC) (option)†
Current Consumption‡:	VEGA-RC Twin 12 with VEGA Unit • Standby = 0.21A (12V DC) • Operation = 2.2A (12V DC) • Peak = 2.9A (12V DC) VEGA-RC Twin 42 with VEGA Unit (option) • Standby = 1.6A-0.11A (24-36V DC) • Operation = 1.2A-0.8A (24-36V DC) • Peak = 1.7A (24-36V DC)

*. Hot-swapping prohibited (e.g., do not plug connectors in or out while the VEGA Unit's power is ON). A limited power source [Class 2] is required.

†. If there is voltage ripple on the applied voltage, be sure that the minimum voltage has not fallen below 20V DC and make that ripple as smooth as possible.

‡. Power voltage is input voltage for the VEGA Unit.

Structural Specifications

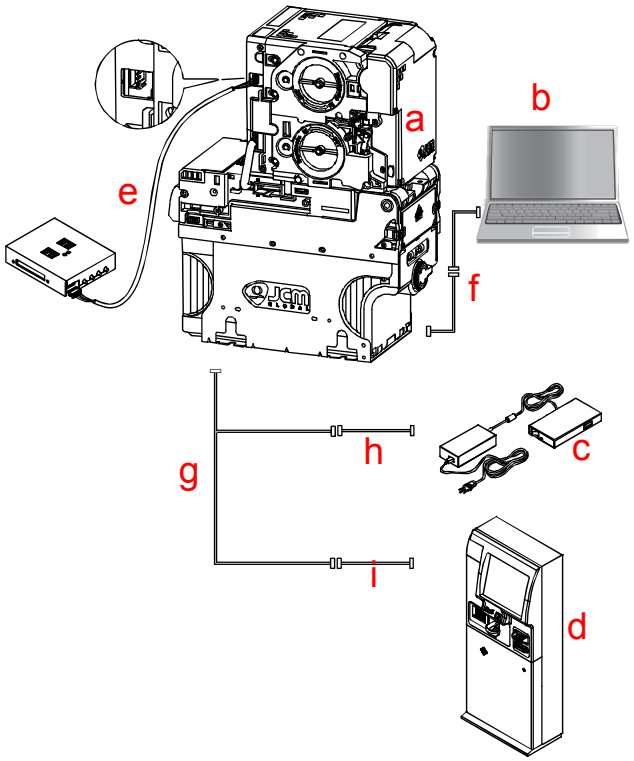
Table 1-5 VEGA-RC Twin Structural Specifications

Weight:	Approximately 1.8kg (4lbs.)
Mounting:	Horizontal*
Outside Dimensions:	See "Entire Unit Outside Dimensions" on page 1-7 of this Manual

*. Both vertical and transverse types should be installed at a 90-degree angle to the frame.

System Configuration

Figure 1-5 illustrates a typical VEGA-RC Twin System configuration.



a) VEGA-RC Twin connected to the VEGA Unit
b) PC (Windows 2000/XP/7)
c) Power Supply
d) Host Machine
e) Maintenance Connector
[to Monitoring Tool]
f) Standard Marketplace Cable
[to VEGA: Mini "B" Plug/to VEGA-RC Twin: Standard "A" Plug]
g) Interface Connector (VEGA)
h) Power Harness
i) Harness

Figure 1-5 VEGA-RC Twin System Configuration

Unit Dimensions

Entire Unit Outside Dimensions

Figure 1-6 illustrates the VEGA-RC Twin Unit outside dimensions.

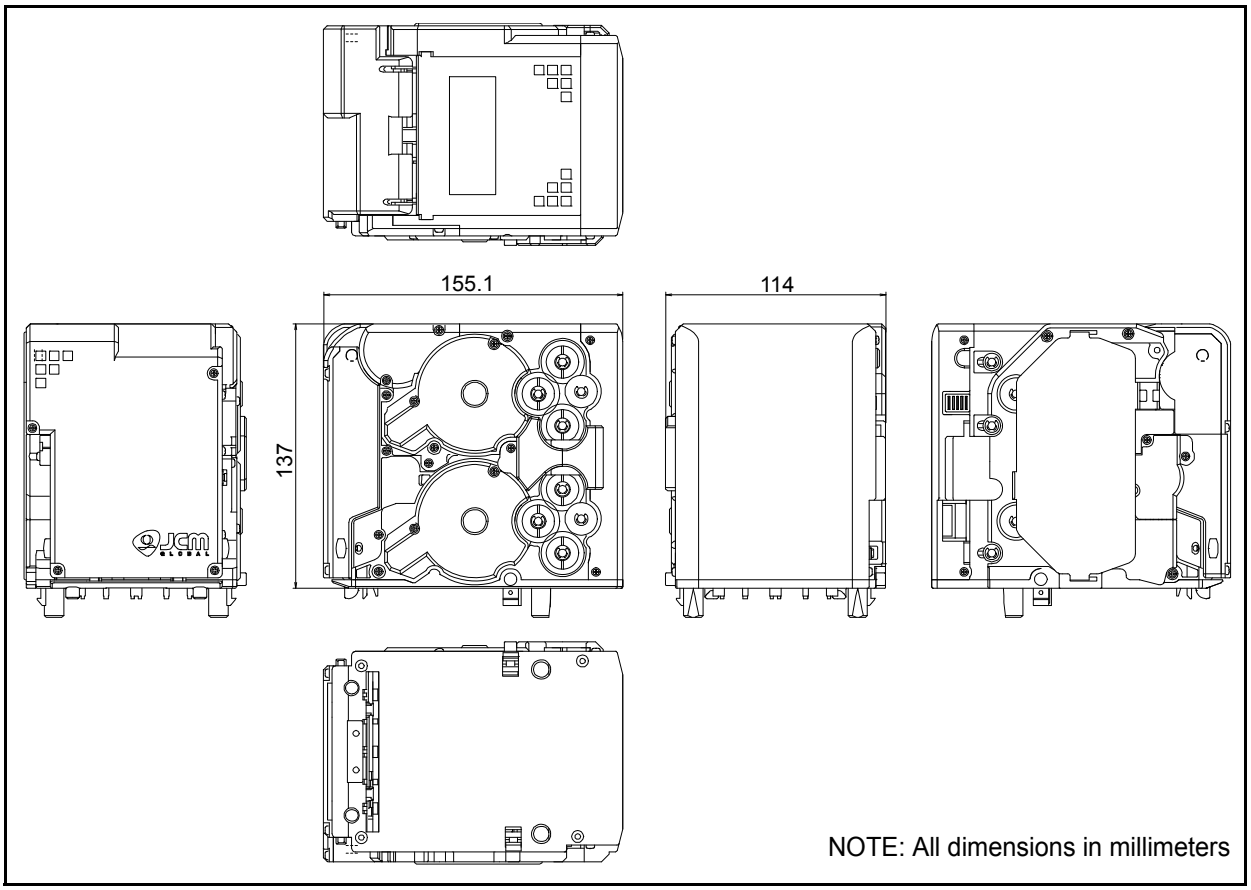


Figure 1-6 VEGA-RC Twin Banknote Recycler's Outside Dimensions

VEGA-RC Twin Unit Clearance Dimensions

Figure 1-7 illustrates the VEGA-RC Twin Unit open Recycler clearance dimensions.

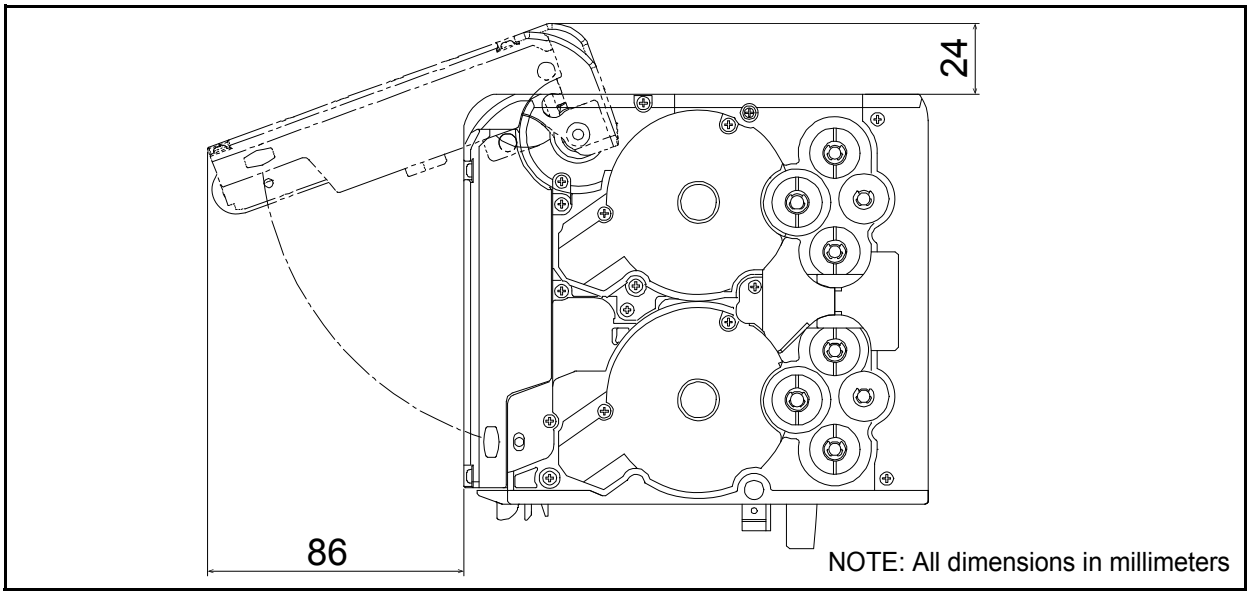


Figure 1-7 VEGA-RC Twin Banknote Recycler's Clearance Dimensions

Technical Contact Information

To obtain further technical information regarding the VEGA-RC Twin device, please contact the nearest location listed below:

Americas

JCM AMERICAN

Phone: +1-702-651-0000

Fax: +1-702-644-5512

925 Pilot Road, Las Vegas, NV 89119

E-mail: support@jcmglobal.com

Europe, Middle East, Africa & Russia

JCM EUROPE GMBH

Phone: +49-211-530-645-60

Fax: +49-211-530-645-85

Mündelheimer Weg 60

D-40472 Düsseldorf Germany

E-mail: support@jcmglobal.eu

UK & Ireland

JCM EUROPE (UK OFFICE)

Phone: +44 (0) 190-837-7331

Fax: +44 (0) 190-837-7834

Unit B, Third Avenue

Denbigh West Business Park

Bletchley, Milton Keynes,

Buckinghamshire MK1 1DH, UK

E-mail: support@jcmglobal.eu

Asia and Oceania

JCM GOLD (HK) LTD.

Phone: +852-2429-7187

Fax: +852-2929-7003

Unit 1-7, 3/F., Favor Industrial Centre

2-6 Kin Hong Street, Kwai Chung,

N.T. Hong Kong

E-mail: asiapactechsupport@jcmglobal.com

JAPAN CASH MACHINE CO., LTD. (HQ)

Phone: +81-6-6703-8400

Fax: +81-6-6707-0348

2-3-15, Nishiwaki, Hirano-ku, Osaka 547-0035 JAPAN

E-mail: Shohin@jcm-hq.co.jp

All of these Websites are available via:
http://www.jcmglobal.com

VEGA-RC Twin™ Series
Banknote Recycler
Section 2

2 INSTALLATION

This section provides installation and operating instructions for the VEGA-RC Twin™ Series Banknote Recycler Unit. The information within this section contains the following features:

- Installation Procedure
- Connector Pin Assignments
- Preventive Maintenance
- Interface Schematic
- Operational Flowchart

Installation Procedure

Perform the following steps to install an optional VEGA-RC Twin Unit on a VEGA Unit body:

1. Place the VEGA-RC Twin into position on top of the VEGA Unit, as shown in Figure 2-1. The four (4) circular guide posts on the bottom of the VEGA-RC Twin Unit should fit directly into the four (4) circular guide hole receptacles located on the VEGA Unit.

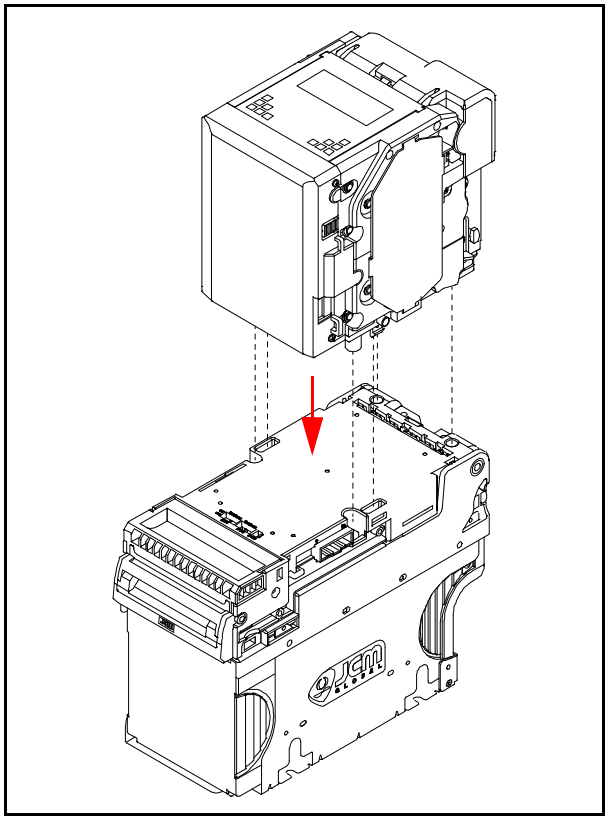


Figure 2-1 VEGA-RC Twin Positioning

2. Gently press the unit down into the mating hole receptacles; listen for a click when the two (2) Latches (Figure 2-2 a) lock into place between the VEGA-RC Twin and the VEGA Unit body.
3. Install the VEGA-RC Twin Harness Cable Connector into its VEGA Unit mating receptacle to interconnect the units (Figure 2-2 b).

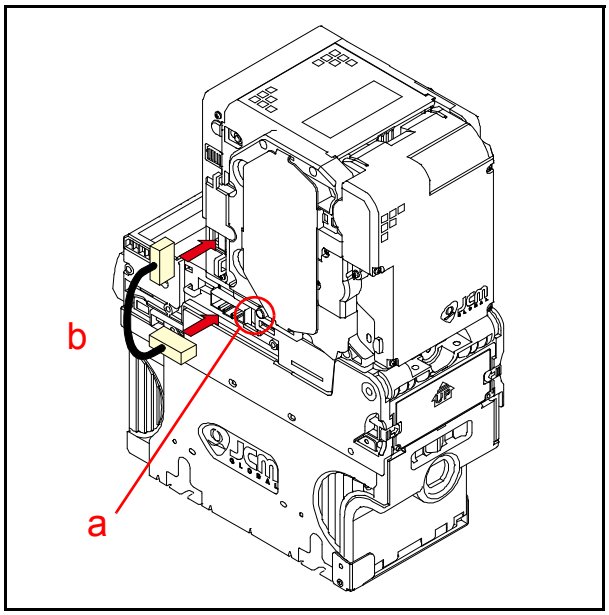


Figure 2-2 Latch Button and Harness Location

Primary LED Indications

The LED Color Pattern indications listed in Table 2-1 occur during various VEGA-RC Twin Unit operating and error conditions.

Table 2-1 LED Pattern Color Indications

Description	Sequence	Condition
Power Supply	● ●	RAM Error (interval: 0.3sec)
	● ●	Normal Boot
Download	● ●	Download Mode
Downloading	● ●	While downloading from the host (VEGA or PC) (interval: 0.5sec)
Download Complete	● ●	Software Reset
Restore Retrieve Dispense	● ●	Stand-by
Restoring Retrieving Dispensing	● ●	Normal Operation (interval: 0.5sec)

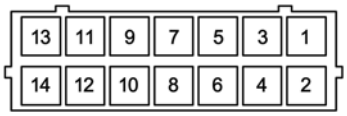
Table 2-1 LED Pattern Color Indications (Cont'd)

Description	Sequence	Condition
Initialize Indications		Initial Movement (interval: 0.5sec)
		Door open (interval: 0.5sec)
		Banknote jam occurs (interval: 0.5sec)
Communication with VEGA Unit		Waiting for communication from a VEGA Unit (interval: 0.5sec)
Door Open		While in Normal Operation (interval: 0.5sec)
Error		Error occurs (Machine Lock)

Connector Pin Assignments

Table 2-2 and Table 2-3 list the VEGA-RC Twin Unit's pin assignments, respectively.
Table 2-2 lists the VEGA-RC Twin to VEGA Unit Receptacle connector pin assignments.

Table 2-2 VEGA-RC Twin Recycler to Acceptor Receptacle Pin Assignments*



Post with Base (Side Type): S14B-PHDSS-B (JST)
Housing: PHDR-14VS
Contact: SPHD-002T-P0.5 / AWG#24-28
Recommended Wire: Slit Wire
Signal Line: UL1061 AWG#28 / Power Supply Line: UL1061 AWG#24

Pin No.	Signal Name	I/O†	Function
1	S GND	-	Signal GND
2	S GND	-	Signal GND
3	VEGA - TXD (DL-TTL)	OUT	Serial data signal output line from Recycler to Acceptor (both DL-TDX signals used)
4	VEGA - RXD (DL-TTL)	IN	Serial data signal input line from Recycler to Acceptor (both DL-TDX signals used)
5	VEGA - ENC	IN	Serial data signal input line from Acceptor to Recycler
6	VEGA - PSI2	IN	Serial data signal input line from Acceptor to Recycler
7	VEGA - FRP	IN	Serial data signal input line from Acceptor to Recycler
8	VEGA - PSI1	IN	Serial data signal input line from Acceptor to Recycler
9	VDD	-	12V DC (24-36V DC)‡
10	VDD	-	12V DC (24-36V DC)‡
11	VDD	-	12V DC (24-36V DC)‡
12	P GND	-	Power GND
13	P GND	-	Power GND
14	P GND	-	Power GND

*. Hot swapping is prohibited! DO NOT connect or disconnect the interconnect cable to or from the unit while the VEGA Unit's power is ON!

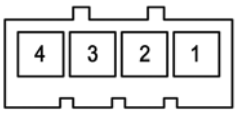
†. I/O (input/output) is the terminal as viewed from the Banknote Recycler's backside.

‡. Voltages in brackets are optional specifications.

Connector Pin Assignments (Continued)

Table 2-3 lists the VEGA-RC Twin to Monitoring Tool pin assignments.

Table 2-3 VEGA-RC Twin Recycler to Monitoring Tool Receptacle Pin Assignments*



Post with Base (Side Type): S4B-PH-K-S (JST)
Housing: PHR-4
Contact: SPH-002T-P0.5S / AWG#24-30
Recommended Wire: Slit Wire AWG#26

Pin No.	Signal Name	I/O†	Function
1	VCC	-	3.3V DC
2	S GND	-	Signal GND
3	SUB - RXD	IN	Serial data signal input line from Monitoring Tool to Recycler
4	SUB - TXD	OUT	Serial data signal output line from Recycler to Monitoring Tool

*. Hot swapping is prohibited! DO NOT connect or disconnect the interconnect cable to or from the unit while the VEGA Unit's power is ON!

†. I/O (input/output) is the terminal as viewed from the Banknote Recycler's backside.

Preventive Maintenance

Clearing a Banknote Jam

To retrieve a jammed Banknote located inside the Banknote Recycler, proceed as follows:

1. Press the Rear Course Open/Close Buttons (Figure 2-3 a) on the Rear Cover (Figure 2-3 b) inward (Figure 2-3 A_1 & A_2).
2. Open the VEGA-RC Twin Rear Cover upward as indicated by red arrow B shown in Figure 2-3.
3. Slide the Gear Cover (Figure 2-3 c) located on the left side of the VEGA-RC Twin Unit in the direction indicated by red arrow C.
4. Take the Gear Cover off the unit in the direction indicated by red arrow D, shown in Figure 2-3.

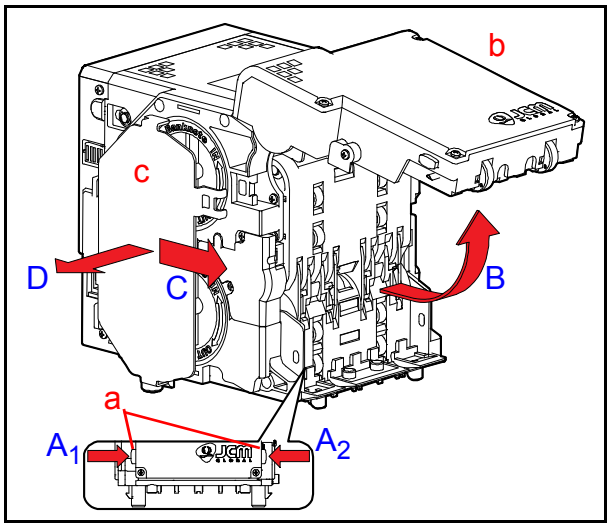


Figure 2-3 Clearing Banknote Jam 1

5. Remove the jammed Banknote from inside of the Banknotes Transport Path (Figure 2-4 A).
6. If the Banknote jam location is not evident or inside the Rear Course, rotate the Recycler Drum Handle Gear Controls (Figure 2-4 a) in the out direction indicated by red arrows in blue circles B_1 & B_2 shown in Figure 2-4.

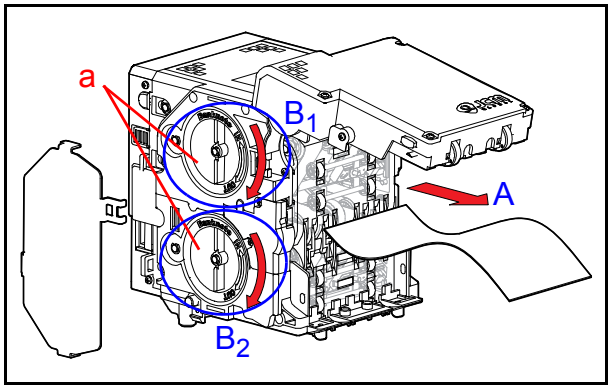


Figure 2-4 Clearing Banknote Jam 2

WARNING: DO NOT rotate the Recycler Drum Handle Gear Controls in the out direction without a Banknote jam in the unit! The Film could wind in the wrong direction, resulting in poor performance.

Cleaning Procedure

To clean the VEGA-RC Twin Recycler section, gently rub the sensors and rollers using ONLY a dry, soft, lint-free cloth.
Do not use any alcohol, solvents, citrus-based products, or abrasive cleaning agents. These can cause damage to the validation section sensors and/or rollers.

Sensor and Roller Cleaning Procedure

To clean the VEGA-RC Twin Unit, proceed as follows:

1. Turn the VEGA-RC Twin Unit's power supply OFF.
2. Open the VEGA-RC Twin Unit's Rear Cover.
3. Clean the appropriate path, lens (yellow indicator) and roller (red/green indicator) shown in Figure 2-5. Be sure to rotate the Recycler Drum Handle Gear Controls (Figure 2-5 a) in the "IN" direction when cleaning the rubber rollers (Figure 2-5 b) using the soft-lint free cloth.

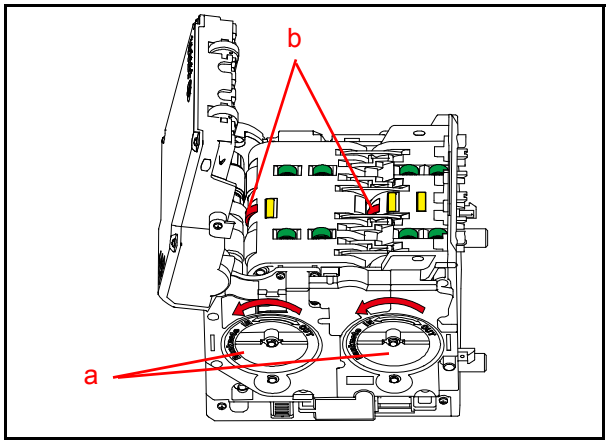


Figure 2-5 Roller Cleaning

Caution: DO NOT rotate the Recycler Drum Handle Gear Controls in the "OUT" direction during Roller cleaning! The Film could wind in the wrong direction, causing poor performance.

Caution: Do not use alcohol, thinner or citrus-based products for cleaning any Banknote Transport Sensors or surfaces. The lenses can become clouded by chemical evaporation residue, causing acceptance errors.

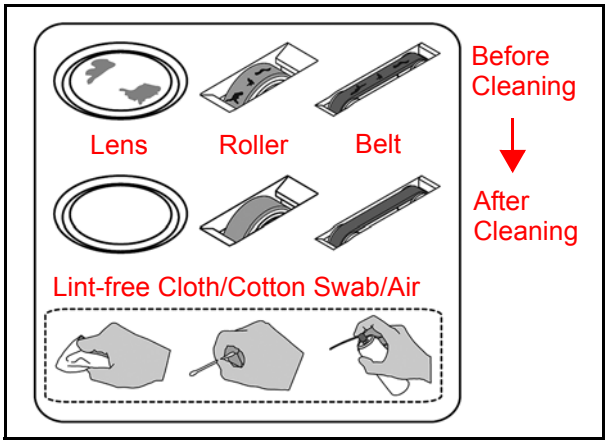


Figure 2-6 Sensor and Roller Cleaning

Sensor and Roller Locations

Figure 2-7 illustrates the various VEGA-RC Twin Unit's sensor cleaning locations. Table 2-4 lists the VEGA-RC Twin sensor type cleaning methods.

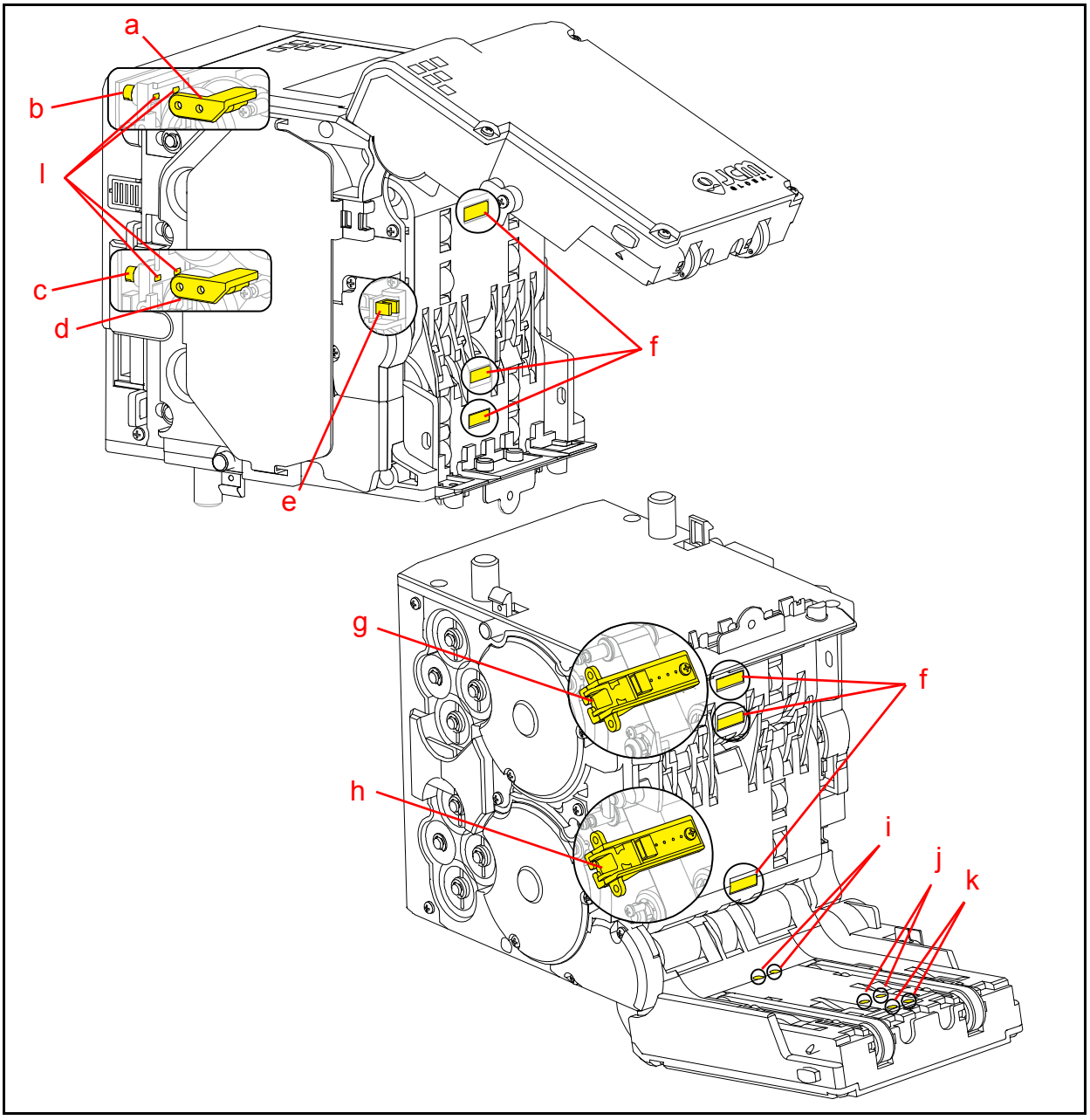


Figure 2-7 VEGA-RC Twin Sensor Cleaning Locations

Table 2-4 VEGA-RC Twin Sensor Type Cleaning Methods

Sym.	Sensor/Roller Type	Sym.	Sensor/Roller Type	Cleaning Method
a	Upper Bobbin End Sensor Prism	g	Lower Film End Sensor	Wipe clean using a soft lint-free cloth or blow clean using compressed air.
b	Upper Bobbin End Sensor	h	Upper Film End Sensor	
c	Lower Bobbin End Sensor	i	Positioning Sensor 3	
d	Lower Bobbin End Sensor Prism	j	Positioning Sensor 2	
e	Door Sensor	k	Positioning Sensor 1	
f	Positioning Sensor Prism	l	Lens	

Standard Interface Circuit Schematics

Figure 2-8 illustrates the VEGA-RC Twin TTL Interface Schematic Diagram (Recycler to Acceptor).

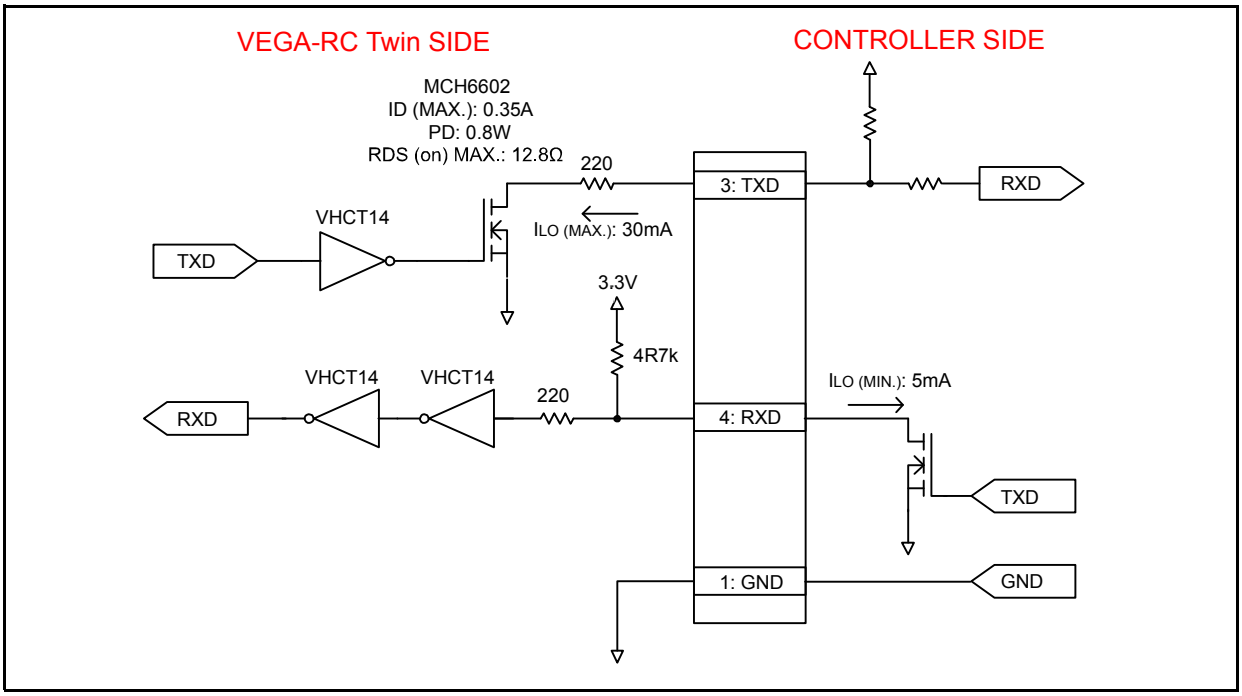


Figure 2-8 VEGA-RC Twin TTL Interface Schematic Diagram (Recycler to Acceptor)

Standard Interface Circuit Schematics

Figure 2-9 illustrates the VEGA-RC Twin TTL Interface Schematic Diagram (Recycler to Monitoring Tool).

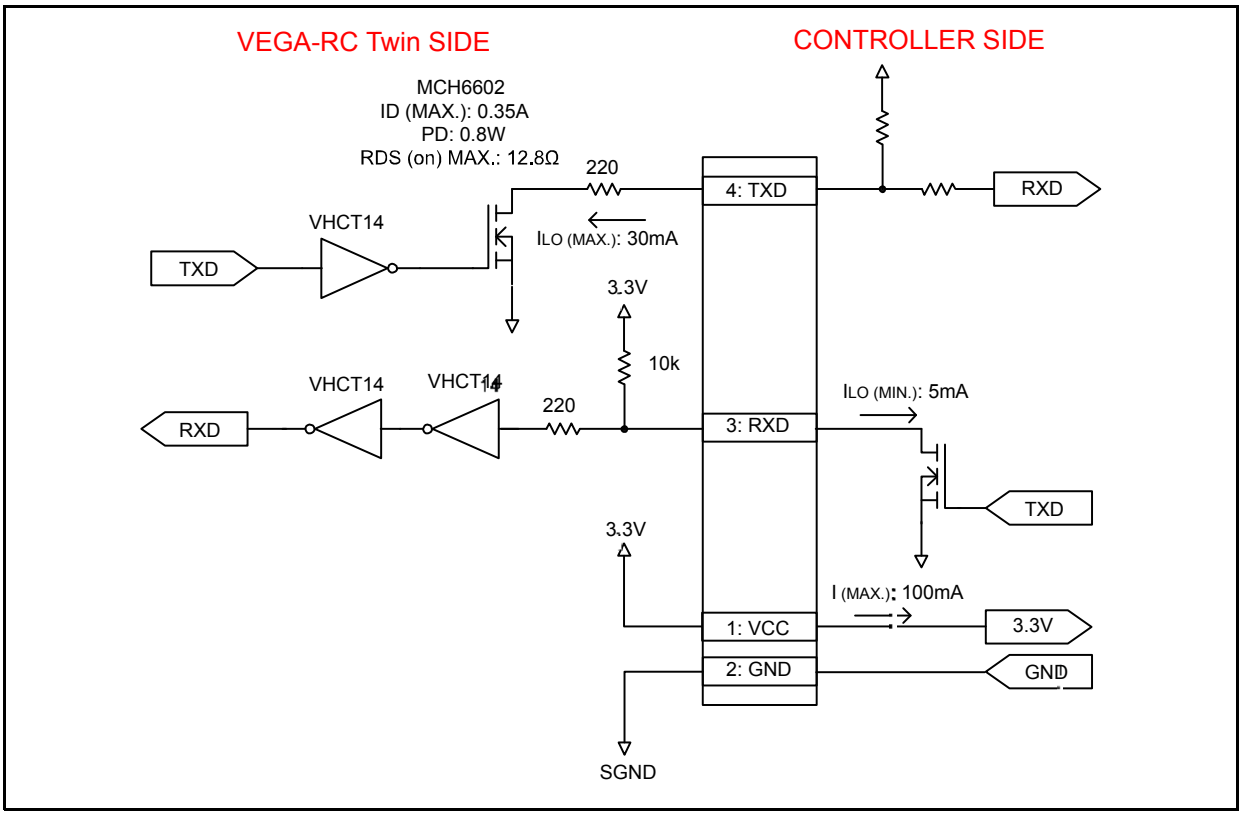
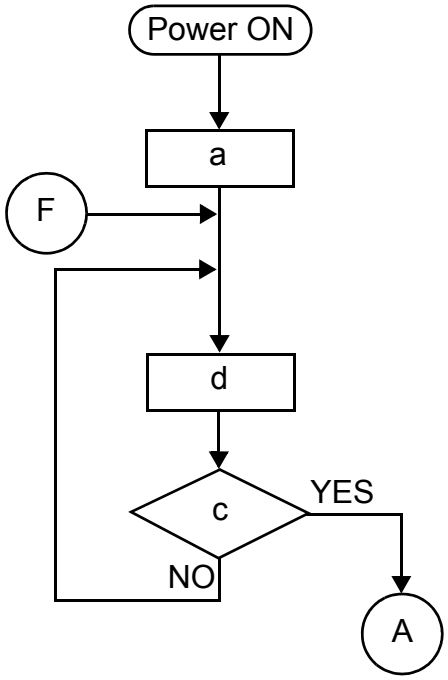


Figure 2-9 VEGA-RC Twin TTL Interface Schematic Diagram (Recycler to Monitoring Tool)

Operational Flowchart

Figure 2-10 depicts part one of a typical VEGA-RC Twin “Initializing” Banknote recycling flow process.



Apply Power to the VEGA-RC Twin Unit.

a) Initializing

F) Return from each flow

b) Stand-by

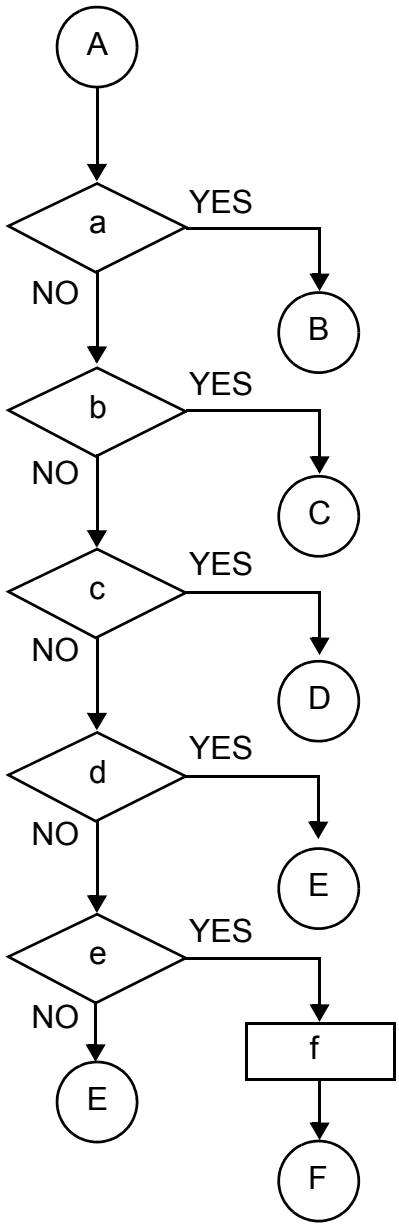
c) Has a command been received from host?

A) To “Main” flow (Figure 2-11)

Figure 2-10 VEGA-RC Twin Operational Flowchart (Part One-Initializing)

Operational Flowchart (Continued)

Figure 2-11 depicts part two of a typical VEGA-RC Twin Banknote recycling “Main” flow process.



A) From “Initializing” flow (Figure 2-10)

a) Has “Dispense 2” command been received?

B) To “Dispensing 2” flow (Figure 2-12)

b) Has “Dispense 1” command been received?

C) To “Dispensing 1” flow (Figure 2-13)

c) Has “Retrieving” command been received?

D) To “Retrieving” flow (Figure 2-14)

d) Has “Clearing Error” command been received?

E) To “Clearing Error” flow (Figure 2-15)

e) Has “Correcting Log” command been received?

f) Sending log to host

E) To “Clearing Error” flow (Figure 2-15)

F) To “Initializing” flow (Figure 2-10)

Figure 2-11 VEGA-RC Twin Operational Flowchart (Part Two-Main Flow)

Operational Flowchart (Continued)

Figure 2-12 depicts part three of a typical VEGA-RC Twin “Dispensing 2” Banknote recycling flow process.

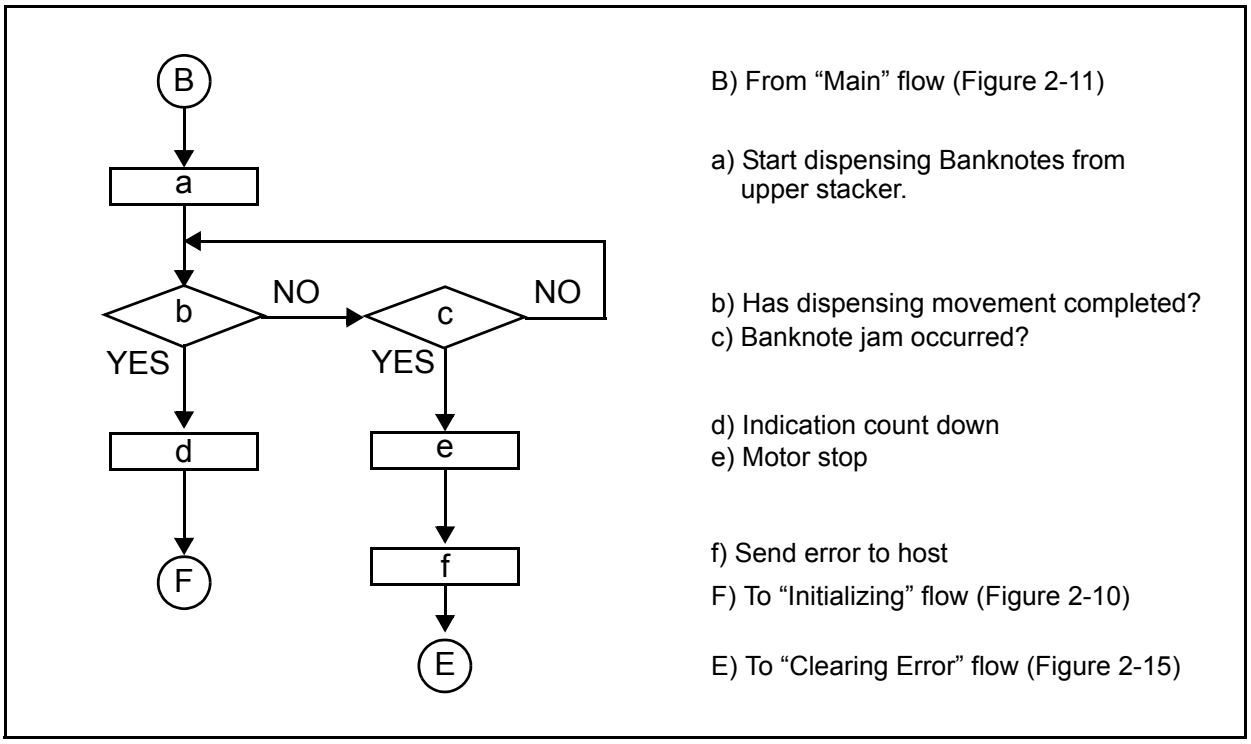


Figure 2-12 VEGA-RC Twin Operational Flowchart (Part Three-Dispensing 2)

Figure 2-13 depicts part four of a typical VEGA-RC Twin “Dispensing 1” Banknote recycling flow process.

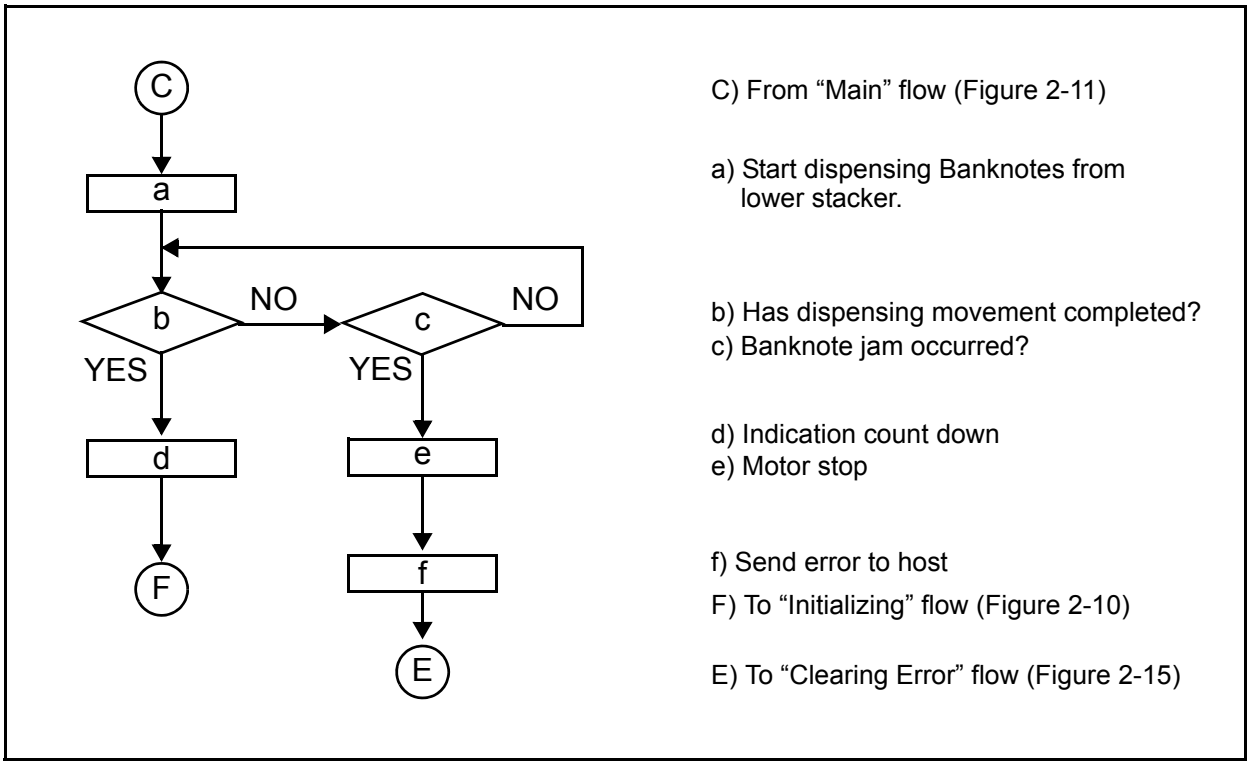


Figure 2-13 VEGA-RC Twin Operational Flowchart (Part Four-Dispensing 1)

Operational Flowchart (Continued)

Figure 2-14 depicts part five of a typical VEGA-RC Twin “Retrieving” Banknote recycling flow process.

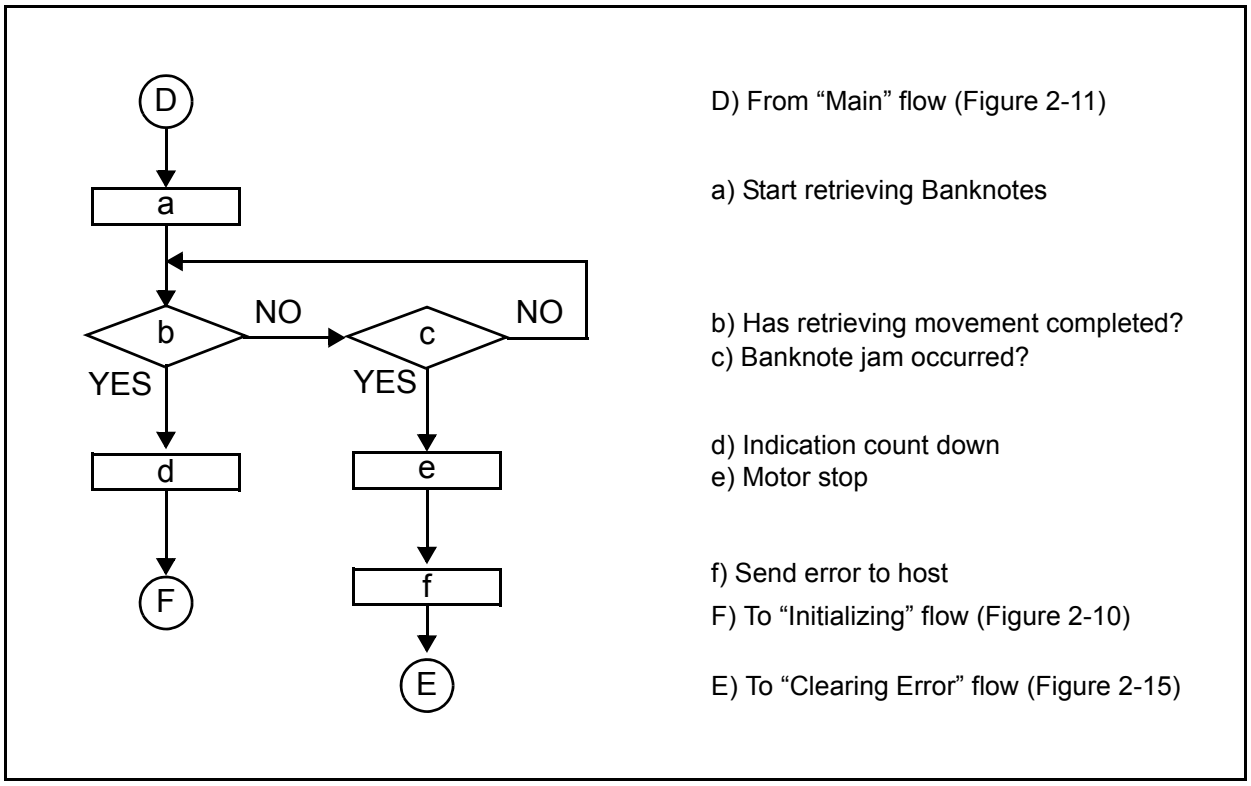


Figure 2-14 VEGA-RC Twin Operational Flowchart (Part Five-Retrieving)

Figure 2-15 depicts part six of a typical VEGA-RC Twin “Clearing Error” Banknote recycling flow process.

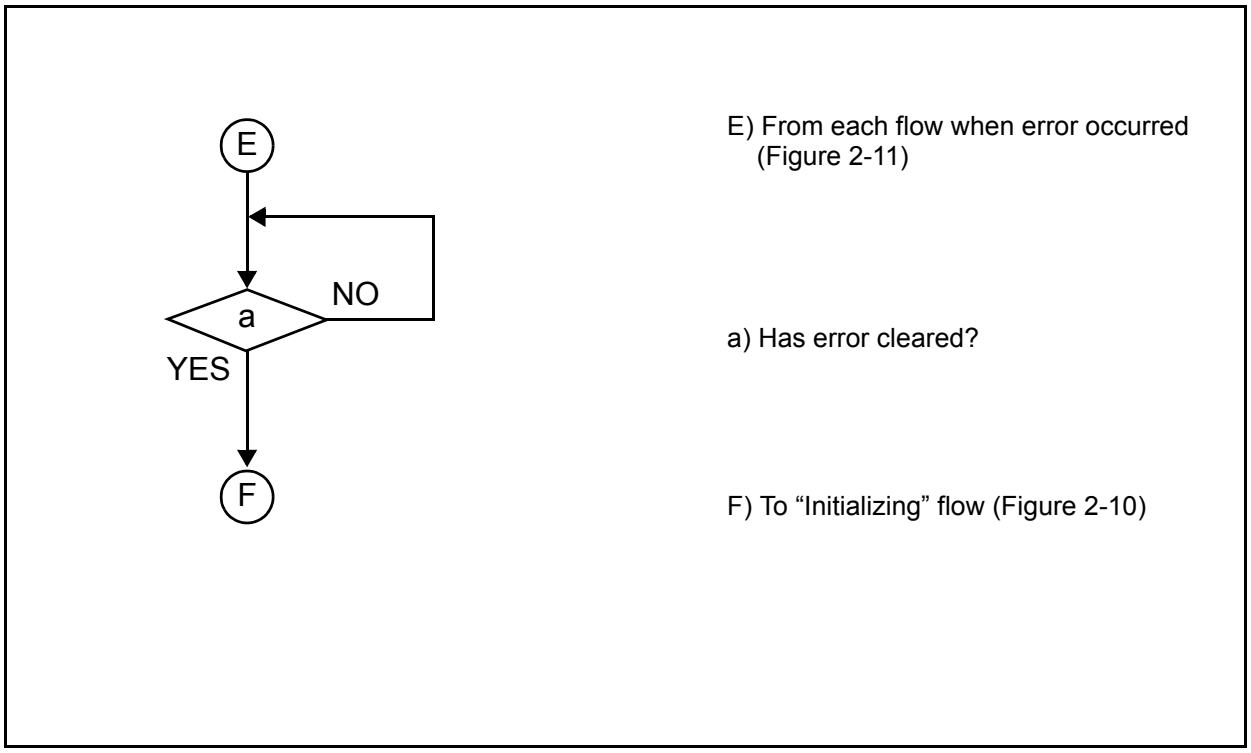


Figure 2-15 VEGA-RC Twin Operational Flowchart (Part Six-Clearing Error)

VEGA-RC Twin™ Series
Banknote Recycler
Section 3

3 COMMUNICATIONS

This section was intentionally left out due to a Non-Disclosure Agreement requirement.

If this information is required, please contact the closest office location listed below:

Americas

JCM American

Phone: +1-702-651-0000

Fax: +1-702-644-5512

925 Pilot Road, Las Vegas, NV 89119

E-mail: support@jcmglobal.com

Europe, Middle East, Africa & Russia

JCM Europe GmbH

Phone: +49-211-530-645-60

Fax: +49-211-530-645-65

Mündelheimer Weg 60

D-40472 Düsseldorf Germany

E-mail: support@jcmglobal.eu

UK & Ireland

JCM Europe (UK Office)

Phone: +44 (0) 190-837-7331

Fax: +44 (0) 190-837-7834

Unit B, Third Avenue

Denbigh West Business Park

Bletchley, Milton Keynes,

Buckinghamshire MK1 1DH, UK

E-mail: support@jcmglobal.eu

Asia and Oceania

JCM Gold (HK) Ltd.

Phone: +852-2429-7187

Fax: +852-2929-7003

Unit 1-7, 3/F., Favor Industrial Centre

2-6 Kin Hong Street, Kwai Chung,

N.T. Hong Kong

E-mail: asiapactechsupport@jcmglobal.com

JAPAN CASH MACHINE CO., LTD. (HQ)

Phone: +81-6-6703-8400

Fax: +81-6-6707-0348

2-3-15, Nishiwaki, Hirano-ku, Osaka 547-0035 JAPAN

E-mail: Shohin@jcm-hq.co.jp

All of these Websites are available via:
http://www.jcmglobal.com

THIS PAGE INTENTIONALLY LEFT BLANK

VEGA-RC Twin™ Series
Banknote Recycler
Section 4

4 DISASSEMBLY/REASSEMBLY

This section provides disassembly and reassembly instructions for the VEGA-RC Twin™ Series Banknote Recycler Unit. This section contains the following information:

- Tool Requirements
- Main Circuit Board Removal
- Sensor Board Removal
- DC Brushless Motor (Upper and Lower Drums) Removal
- Entrance Sensor Board Removal
- DC Brushless Motor (Rear Unit) Removal
- Timing Belt Removal
- Interrupt Board Removal
- Upper Unit Rubber Pulley and Drive Roller Removal
- Upper Unit Film and Film2 Removal
- Lower Unit Rubber Pulley and Drive Roller Removal
- Solenoid Removal
- Lower Unit Film and Film2 Removal
- Film and Film2 Installation

Tool Requirements

The following tools will be required to perform the VEGA-RC Twin disassembly and reassembly.

- #1 & #2 Phillips Screw Drivers
- Set of Jewelers Phillips Screw Drivers
- E-Clip Holder
- Pliers
- Tweezers

Main Circuit Board Removal

To remove the Main Circuit Board, proceed as follows:

1. Open the Rear Unit and remove the Gear Cover (Figure 4-1 a) from the right side of the VEGA-RC Twin Unit.

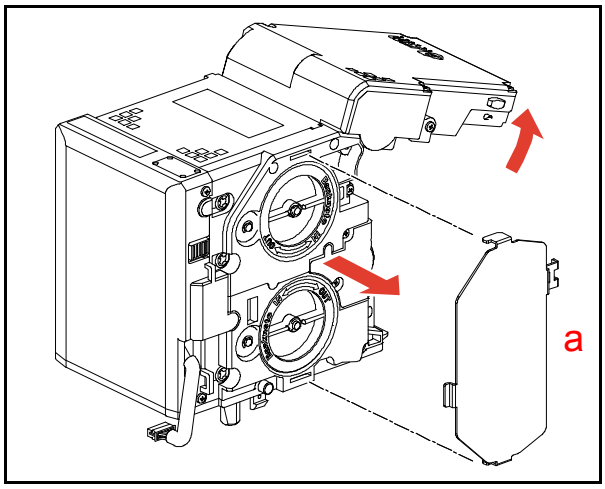


Figure 4-1 Gear Cover Removal

2. Remove the four (4) Mounting Screws (Figure 4-2 a_1 through a_4) retaining the Front Cover (Figure 4-2 b).

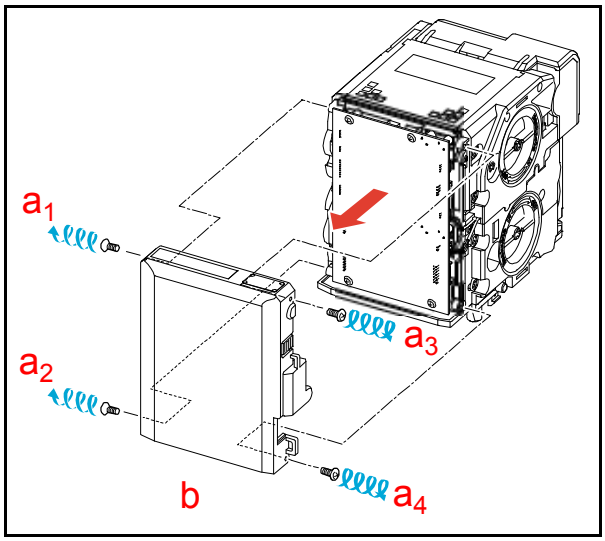


Figure 4-2 Front Cover Removal

3. Remove the four (4) Mounting Screws (Figure 4-3 a_1 through a_4) retaining the Main Circuit Board (Figure 4-3 b) and take the Main Circuit Board off the VEGA-RC Twin Unit.

4. Unplug the eight (8) Connectors (Figure 4-3 c_1 through c_8) attached to the Main Circuit Board.

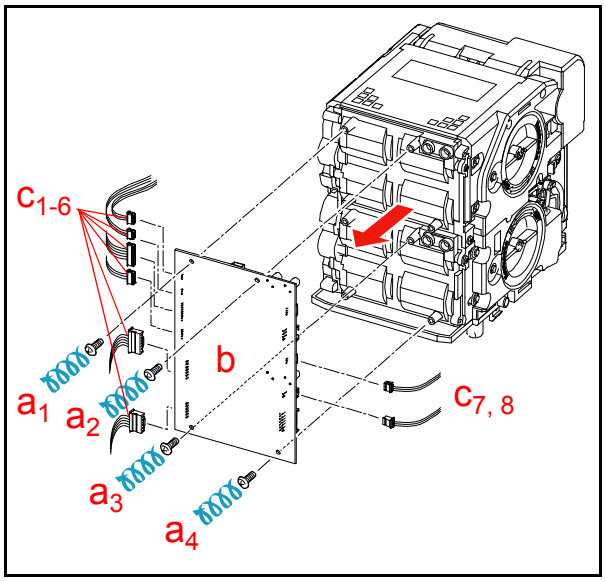


Figure 4-3 Main Circuit Board Removal

Sensor Board Removal

To remove the Sensor Board, proceed as follows:

1. Remove the four (4) Screws (Figure 4-4 a_1 through a_4) retaining the two (2) Motor Set Covers (Figure 4-4 b_1 & b_2) and take the Motor Set Covers off the VEGA-RC Twin Unit.

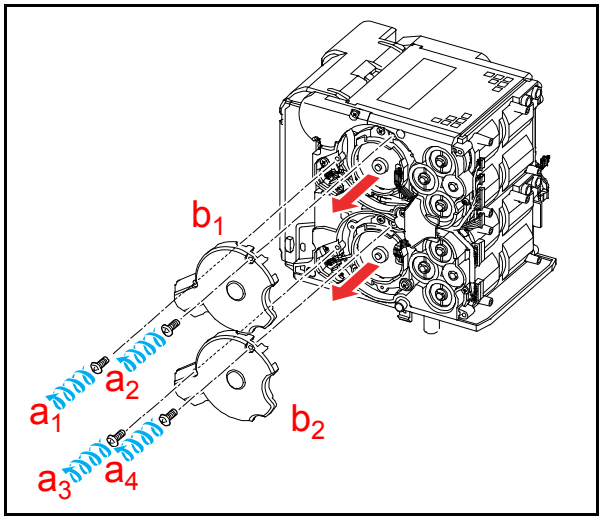


Figure 4-4 Motor Set Cover Removal

2. Remove the four (4) Mounting Screws (Figure 4-5 a_1 through a_4) retaining the two (2) Sensor Holders (Figure 4-5 b_1 & b_2) in place, and take the Sensor Holders off the VEGA-RC Twin Unit.

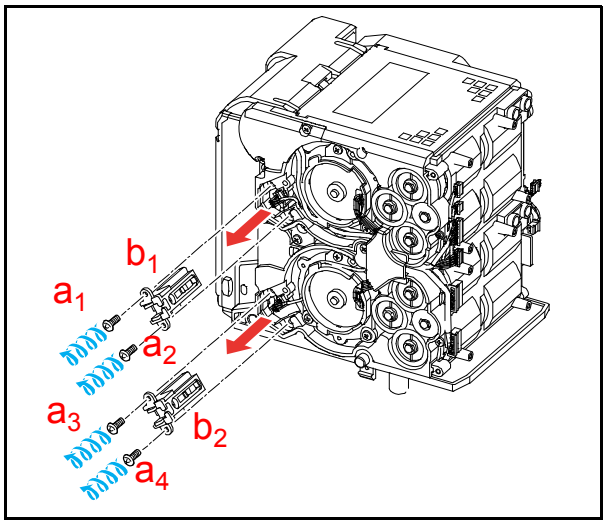


Figure 4-5 Sensor Holder Removal

3. Remove the single (1) Mounting Screw (Figure 4-6 a) retaining the Sensor Board (Figure 4-6 b), and remove the Sensor Board from the Sensor Holder.
4. Unplug the single (1) Connector (Figure 4-6 c) attached to the Sensor Board.

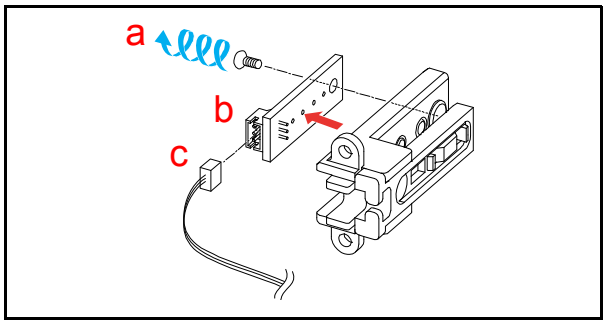


Figure 4-6 Sensor Board Removal

DC Brushless Motor (Upper and Lower Drums) Removal

To remove the DC Brushless Motor from the Upper and Lower Drums, proceed as follows:

1. Remove the single (1) Mounting Screw (Figure 4-7 a) retaining the Harness Cover (Figure 4-7 b), and remove the Harness Cover from the VEGA-RC Twin Unit.

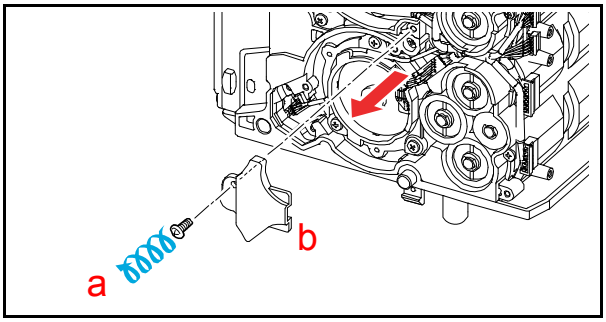


Figure 4-7 Harness Cover Removal

2. Remove the six (6) Mounting Screws (Figure 4-8 a_1 through a_6) retaining the Upper Drum Motor (Figure 4-8 b) and the Lower Drum Motor (Figure 4-8 c), and pull both Drums from the VEGA-RC Twin Unit.

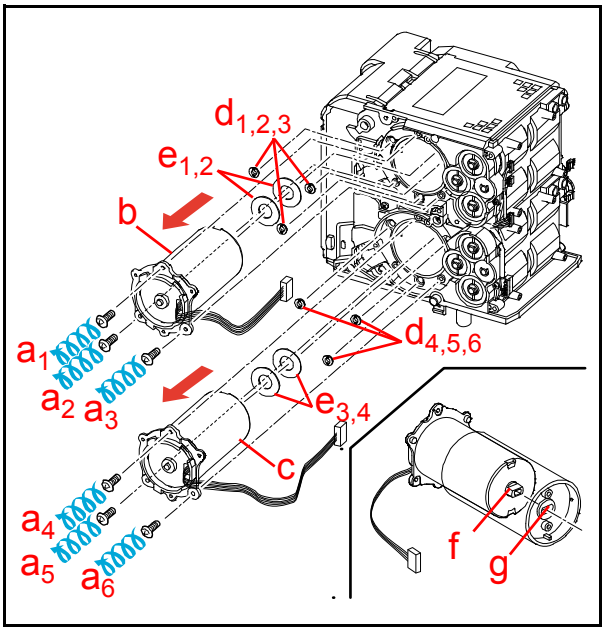


Figure 4-8 Drum Motor Removal

NOTE: Be careful when removing the Lower and Upper Drums that the six (6) Drum Guides (Figure 4-8 d_1 through d_6) and the four (4) Washers (Figure 4-8 e_1 through e_4) are not accidentally lost following removal.

NOTE: When re-installing the Drums into the VEGA-RC Twin Unit, be sure that the flat faces of the Drum Motor edge (Figure 4-8 f) and the Main Drum (Figure 4-8 g) properly align. Ensure that the Guides and the Washers are properly installed with the Drums.

3. Pull the DC Brushless Motor (Figure 4-9 a) out of the Drum Motor Cover (Figure 4-9 b).
4. Remove the two (2) Mounting Screws (Figure 4-9 c_1 & c_2) retaining the Planetary Base (Figure 4-9 d), and take the Planetary Base off the DC Brushless Motor (Figure 4-9 d).

NOTE: Be careful when removing the Lower and Upper Drums that the Spacers (Figure 4-9 e_1 & e_2) are not accidentally lost following removal.

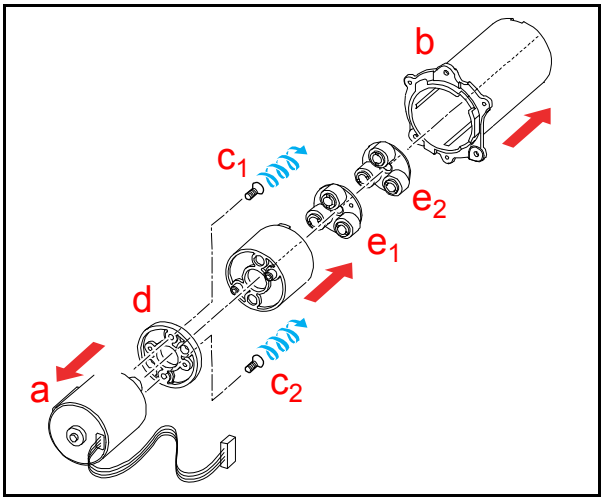


Figure 4-9 DC Brushless Motor Removal

NOTE: Each Brushless Motor has individual specifications.
- For Upper Unit: 7-Pin Connector (J020)
- For Lower Unit: 6-Pin Connector (J010)

Entrance Sensor Board Removal

To remove the Entrance Sensor Board, proceed as follows:

1. Remove the four (4) Mounting Screws (Figure 4-10 a_1 through a_4) retaining the Rear Cover (Figure 4-10 b), and take the Rear Cover off the VEGA-RC Twin Unit.

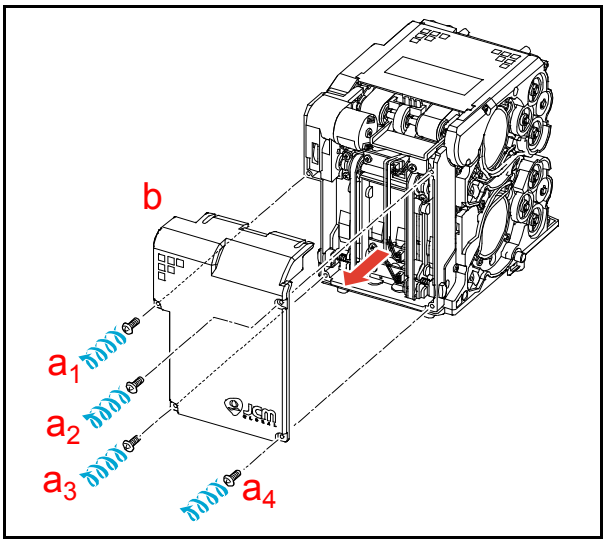


Figure 4-10 Rear Cover Removal

2. Remove the single (1) Mounting Screw (Figure 4-11 a_1, a_2 and a_3) from each Entrance Sensor Board (Figure 4-11 b_1, b_2 & b_3), and remove the three (3) Entrance Sensor Boards from the VEGA-RC Twin Unit.

3. Unplug the three (3) Connectors (Figure 4-11 c_1, c_2 and c_3) from each Entrance Sensor Board.

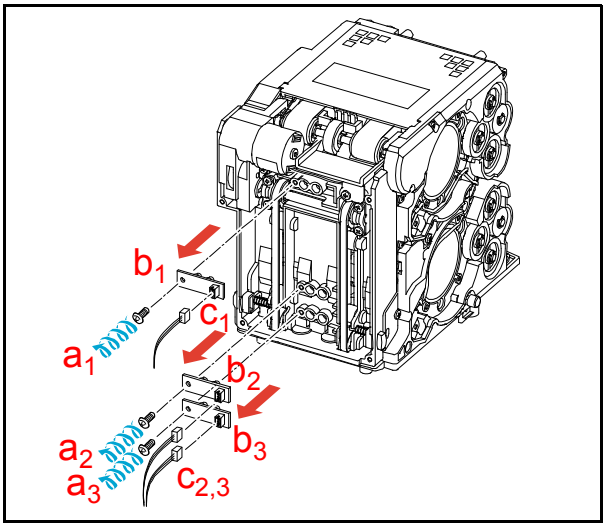


Figure 4-11 Entrance Sensor Board Removal

DC Brushless Motor (Rear Unit) Removal

To remove the DC Brushless Motor from the Rear Unit, proceed as follows:

1. Remove the two (2) Mounting Screws (Figure 4-12 a_1 & a_2) retaining the Gear Box (Figure 4-12 b) in place, and remove the Gear Box from the VEGA-RC Twin Unit.
2. Unplug the single (1) Connector (Figure 4-12 c) attached to the DC Brushless Motor (Figure 4-12 d).

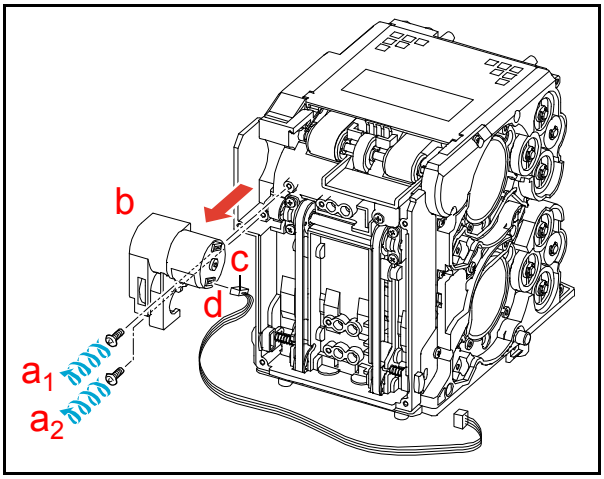


Figure 4-12 Gear Box Removal

3. Remove the two (2) Mounting Screws (Figure 4-13 a_1 & a_2) mounting the DC Brushless Motor (Figure 4-13 b) with the Pinion Gear (Figure 4-13 c), and remove the DC Brushless Motor Assembly from the Gear Box (Figure 4-13 d).
4. Remove the single (1) Pinion Gear from the DC Brushless Motor.

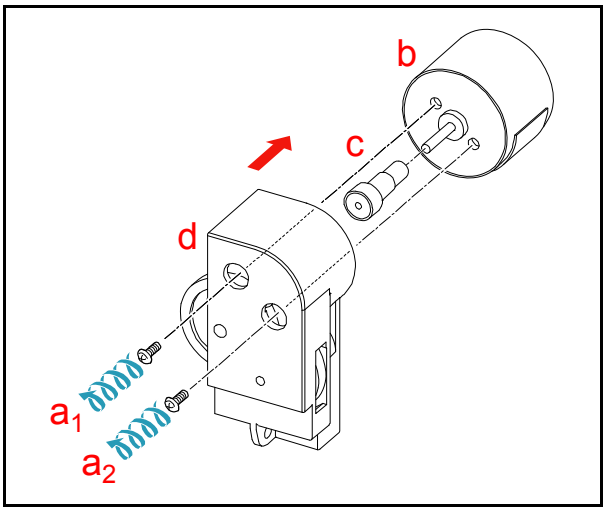


Figure 4-13 DC Brushless Motor Removal

Timing Belt Removal

To remove the Timing Belts, proceed as follows:

1. Remove the four (4) Mounting Screws (Figure 4-14 a_1 through a_4) retaining the Pulley (Figure 4-14 b), and remove the Pulley from the VEGA-RC Twin Unit.

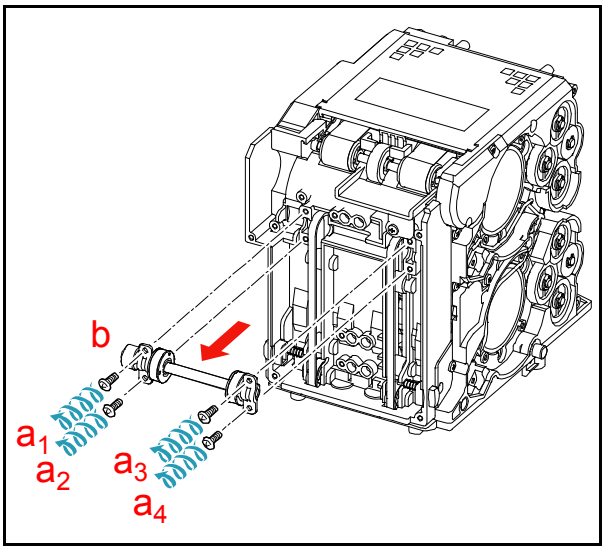


Figure 4-14 Pulley Removal

2. Open the Rear Unit (Figure 4-15 a), and remove the two (2) Timing Belts (Figure 4-15 b_1 & b_2), the two (2) Drive Pulleys (Figure 4-15 c_1 & c_2) and the four (4) Support Pulleys (Figure 4-15 d_1 through d_4) from the Rear Unit.

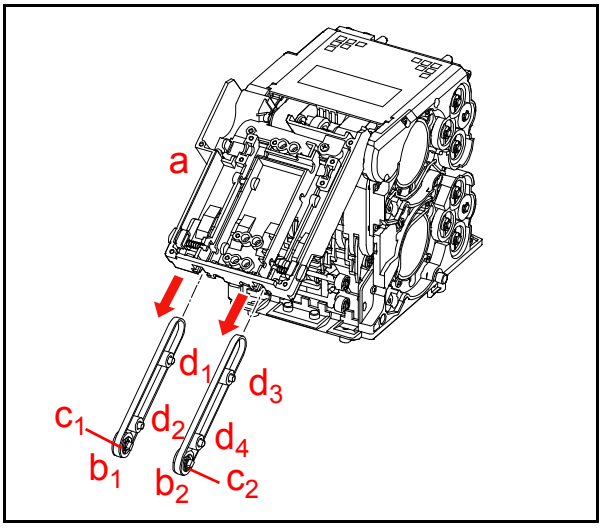


Figure 4-15 Timing Belt Removal

Interrupt Board Removal

To remove the Interrupt Board, proceed as follows:

1. Remove the two (2) Mounting Screws (Figure 4-16 a_1 & a_2) retaining the Solenoid Cover (Figure 4-16 b), and take the Solenoid Cover off the VEGA-RC Twin Unit.
2. Remove the two (2) Mounting Screws (Figure 4-16 c_1 & c_2) from the right side of the VEGA-RC Twin Unit.

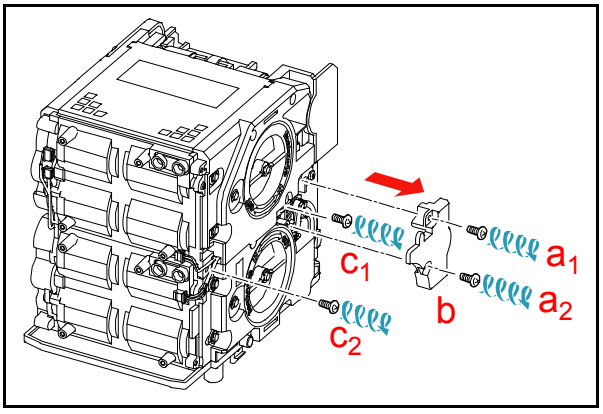


Figure 4-16 Solenoid Cover Removal

3. Remove the two (2) Mounting Screws (Figure 4-17 a_1 & a_2) from the left side of the VEGA-RC Twin Unit and separate the Upper and the Lower Units.

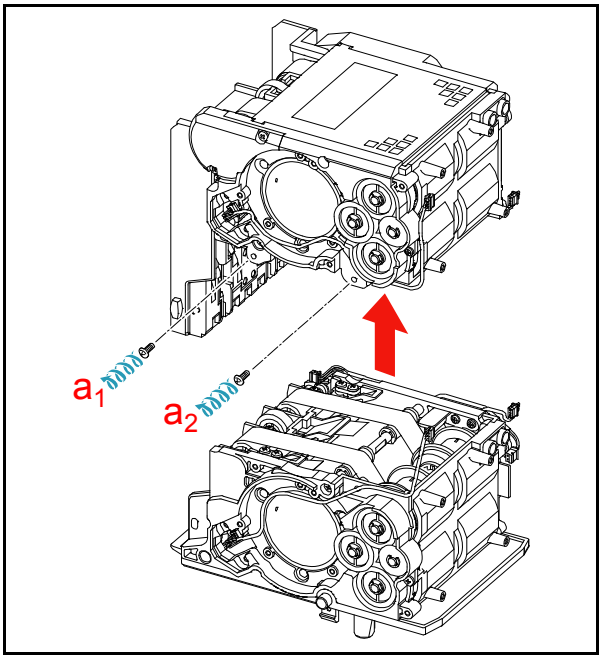


Figure 4-17 Upper Unit and Lower Unit Separation

4. Remove the four (4) Mounting Screws (Figure 4-18 a_1 through a_4) retaining the Course Up Unit (Figure 4-18 b), and release the Course Up Unit from the Rear Unit (Figure 4-18 c).
5. Remove the single (1) Mounting Screw (Figure 4-18 d) retaining the Interrupt Board (Figure 4-18 e), and remove the Interrupt Board from the Course Up Unit.
6. Unplug the single (1) Connector (Figure 4-18 f) attached to the Interrupt Board.

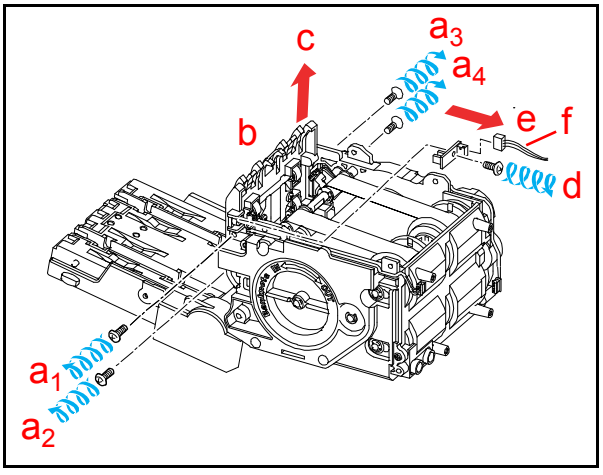


Figure 4-18 Interrupt Board Removal

Upper Unit Rubber Pulley and Drive Roller Removal

To remove the Rubber Pulley and the Drive Roller from the Upper Unit, proceed as follows:

1. Remove the two (2) E-Rings (Figure 4-19 a_1 & a_2) retaining the Rubber Pulley Unit (Figure 4-19 c), and remove the two (2) Bushings (Figure 4-19 b_1 & b_2) and the Rubber Pulley Unit from the Course Up Unit.

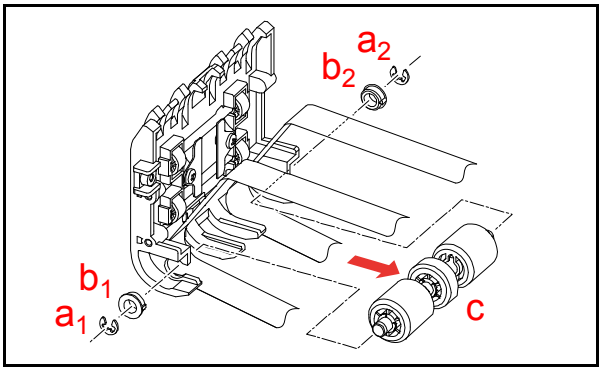


Figure 4-19 Rubber Pulley Unit Removal

2. Remove the three (3) E-Rings (Figure 4-20 a_1, a_2 & a_3), the two (2) Rubber Pulleys (Figure 4-20 b_1 & b_2), the single (1) Drive Roller (Figure 4-20 c) and the three (3) Parallel Pins (Figure 4-20 d_1, d_2 & d_3) from the Shaft (Figure 4-20 e).

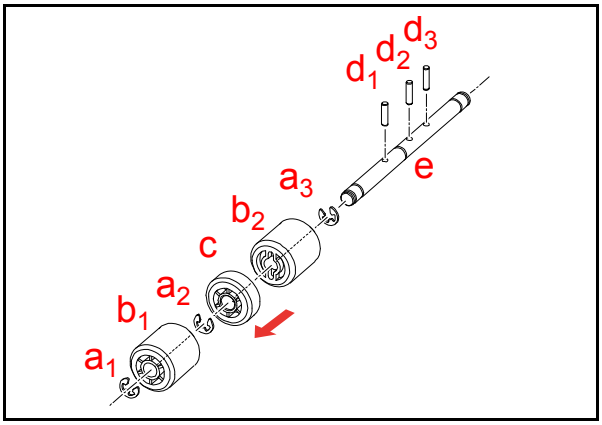


Figure 4-20 Rubber Pulley and Drive Roller Removal

Upper Unit Film and Film2 Removal

To remove the Film and Film2 from the Upper Unit, proceed as follows:

1. Remove the two (2) Mounting Screws (Figure 4-21 a_1 & a_2) retaining the Fulcrum Cover (Figure 4-21 b), and remove the Fulcrum Cover from the Upper Unit.
2. Remove the two (2) Mounting Screws (Figure 4-21 c_1 & c_2) retaining the Top Cover (Figure 4-21 d), and take the Top Cover off the Upper Unit.

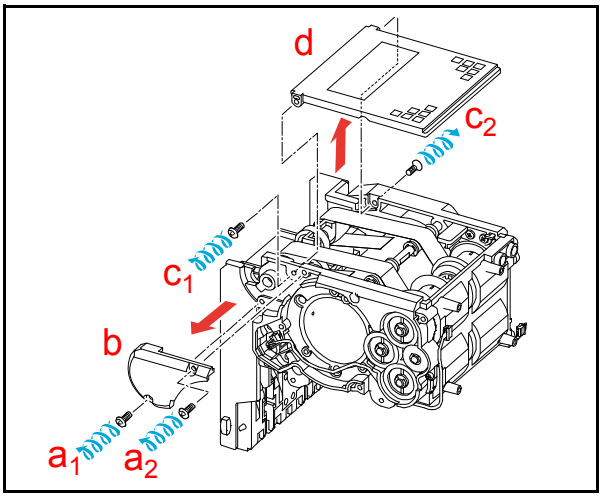


Figure 4-21 Fulcrum Cover and Top Cover Removal

3. Remove the Shaft by using a fine-tipped tool (such as a screwdriver) to push the Shaft in the direction of the red arrows (Figure 4-22 a). At the same time, remove the Crown Pulley (Figure 4-22 b_1 & b_2), the Sponge Roller (Figure 4-22 c), and the Fulcrum Kick Spring L and Fulcrum Kick Spring R (Figure 4-22 d_1 & d_2) from the Shaft. Then separate the Rear Unit (Figure 4-22 e) from the VEGA-RC Twin Unit (Figure 4-22 f).

NOTE: When reassembling the Crown Pulley, the Sponge Roller, and the Fulcrum Kick Spring L and R to the Shaft, hook the Kick Springs (Figure 4-22 d_1 & d_2) as indicated in illustration A.

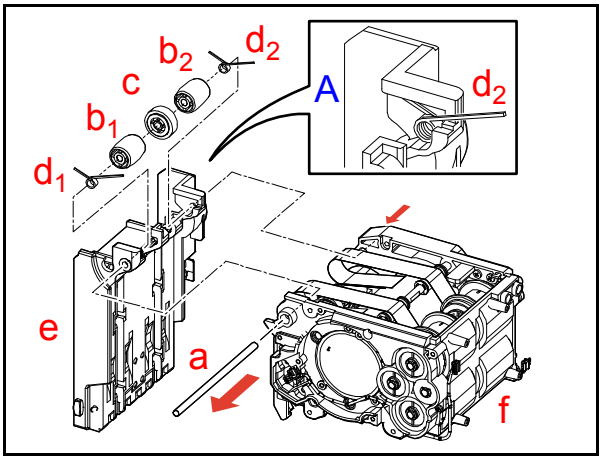


Figure 4-22 Rear Unit Separation

4. Remove the two (2) Mounting Screws (Figure 4-23 a_1 & a_2) located on both sides of the

Rear Unit, and take the Front Frame (Figure 4-23 b) off the Rear Unit.

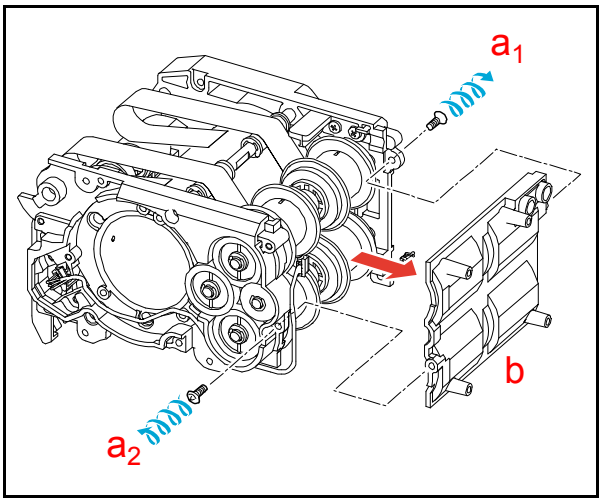


Figure 4-23 Front Frame Removal

5. Rotate the Handle Gear (Figure 4-24 a) clockwise and roll the Film until the Clip (Figure 4-24 b) attached to the Drum Unit appears.

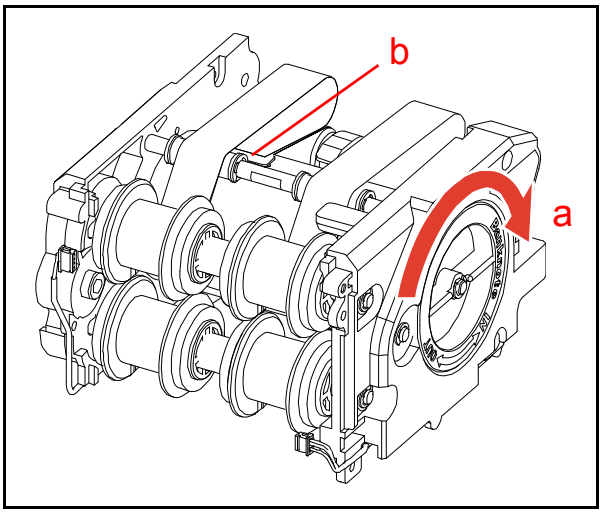


Figure 4-24 Film Rolling

6. Remove the single (1) E-Ring (Figure 4-25 a) retaining the Handle Gear (Figure 4-25 b), and then remove the Handle Gear, the single (1) Bushing (Figure 4-25 c) and the single (1) Parallel Pin (Figure 4-25 d).
7. Remove the single (1) E-Ring (Figure 4-25 e) retaining the Clutch Gear (Figure 4-25 f), and then remove the Clutch Gear, the single (1) Bushing (Figure 4-25 g) and the single (1) Poly Slider (Figure 4-25 h).
8. Remove the two (2) E-Rings (Figure 4-25 i_1 & i_2) and two (2) Bushings (Figure 4-25 j_1 & j_2) from the Rear Unit.

NOTE: When re-installing the Clutch Gear (Figure 4-25 f), the arrow die stamped side should face the Shaft, as indicated in illustration A.

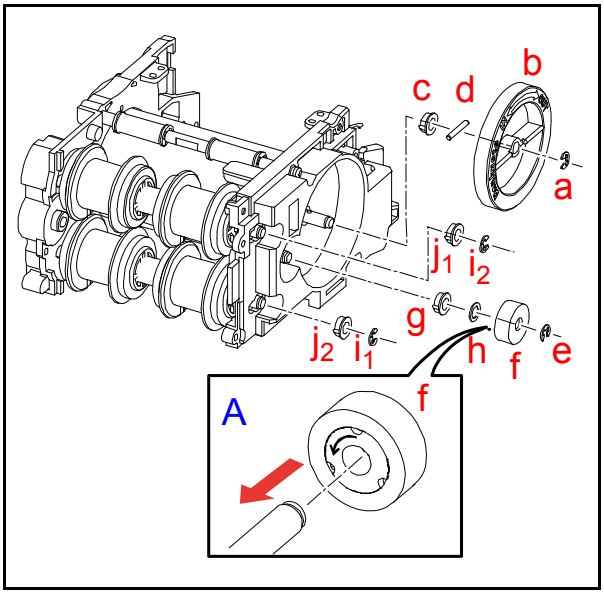


Figure 4-25 Handle Gear and Clutch Gear Removal

9. Remove the two (2) Mounting Screws (Figure 4-26 a_1 & a_2) retaining the Upper Side Frame R (Figure 4-26 b), and take the Upper Side Frame R off the Rear Unit.

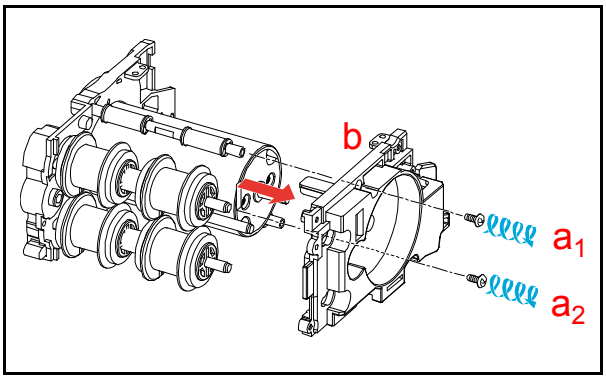


Figure 4-26 Upper Side Frame R Removal

10. Remove the two (2) E-Rings (Figure 4-27 a_1 & a_2) retaining each Film Bobbin Drive Gear (Figure 4-27 b_1 & b_2). Next, remove the two (2) Film Bobbin Drive Gears and the two (2) Parallel Pins (Figure 4-27 c_1 & c_2). Then remove the two (2) Frame Shaft Assemblies (Figure 4-27 d_1 & d_2).

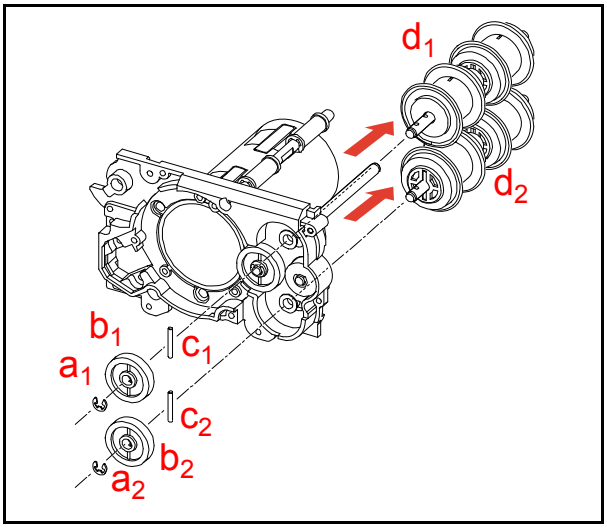


Figure 4-27 Frame Shaft Assembly Removal

11. Remove the two (2) Clips (Figure 4-28 a_1 & a_2) and the two (2) Films (Figure 4-28 b_1 & b_2) from the Main Drum.

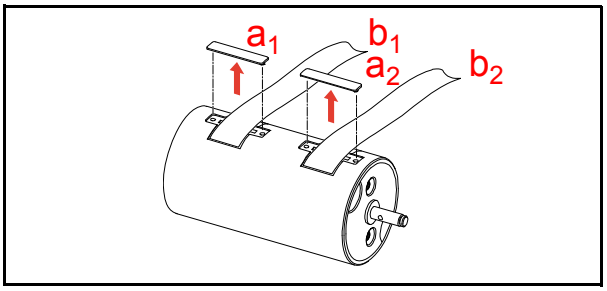


Figure 4-28 Clip Removal

12. Slide the Film Bobbins (Figure 4-29 a_1 & a_2) to the inside, and pull the single (1) Parallel Pin (Figure 4-29 b) out of the Shaft.
13. Separate the two (2) Film Bobbins from each other.

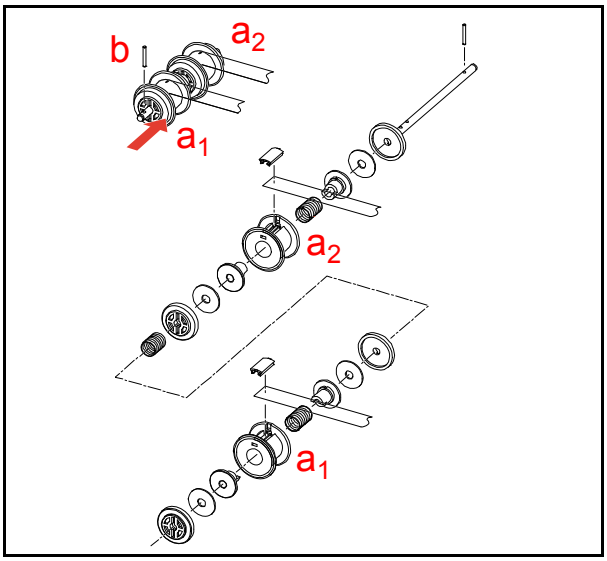


Figure 4-29 Film Bobbin Removal

NOTE: When rolling the Film back onto the Bobbins (Figure 4-30 a), be sure to rotate the Film in the direction indicated by the arrow printed on the Bobbin. When re-installing the Limit Kick Spring (Figure 4-30 b), insert one end of the spring into the hole (Figure 4-30 c) located on the right side of the Film Bobbin Core (Figure 4-30 d). When reinstalled correctly, the Film and Film2 will automatically self-retract when gently pulled on. Review "Film and Film2 Installation" on page 4-11 for Film installation.

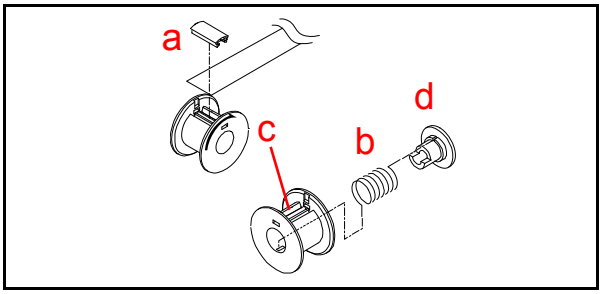


Figure 4-30 Frame Shaft & Limit Spring Assembly

Lower Unit Rubber Pulley and Drive Roller Removal

To remove the Rubber Pulley and Drive Roller from the Lower Unit, proceed as follows:

1. Remove the four (4) Mounting Screws (Figure 4-31 a_1 through a_4) retaining the Bottom Unit Cover (Figure 4-31 b), and take the Bottom Unit Cover off the Lower Unit.

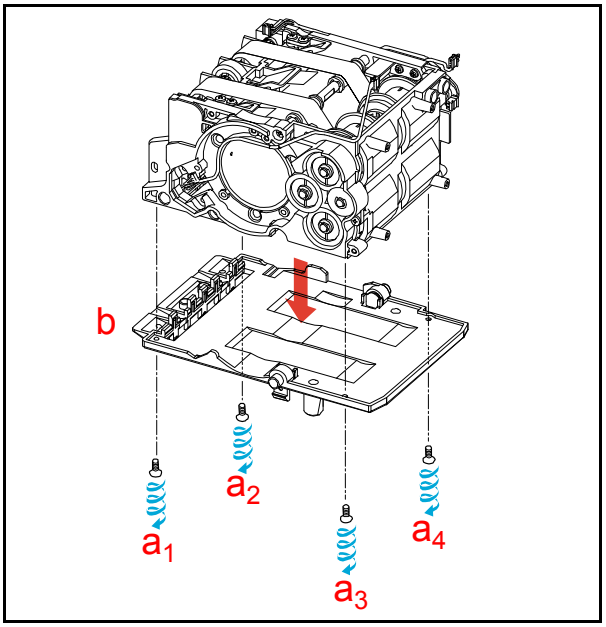


Figure 4-31 Bottom Unit Cover Removal

2. Remove the three (3) Mounting Screws (Figure 4-32 a_1, a_2 & a_3) from both sides of the Lower Unit and remove the Lower Course Unit (Figure 4-32 b).

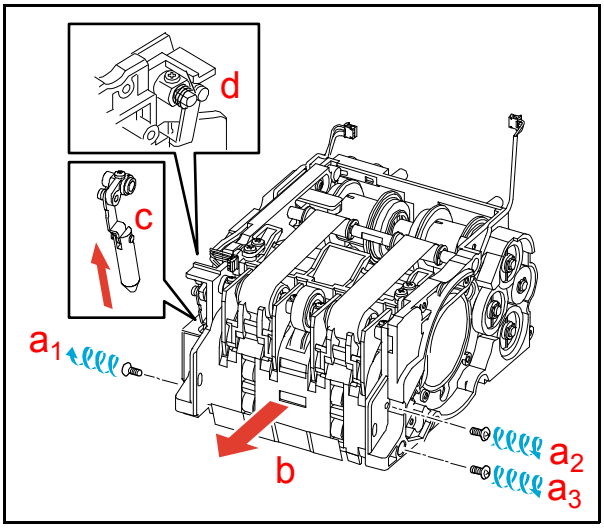


Figure 4-32 Lower Course Unit Removal

NOTE: When removing the Lower Course Unit , pull the Solenoid Plunger (Figure 4-32 c).
When re-installing the Solenoid Plunger, hook the Spring as indicated (Figure 4-32 d).

3. Remove the two (2) E-Rings (Figure 4-33 a_1 & a_2) retaining the Rubber Pulley Unit (Figure 4-33 c), and then remove the two (2) Bushings (Figure 4-33 b_1 & b_2) and the Rubber Pulley Unit from the Lower Course Unit.

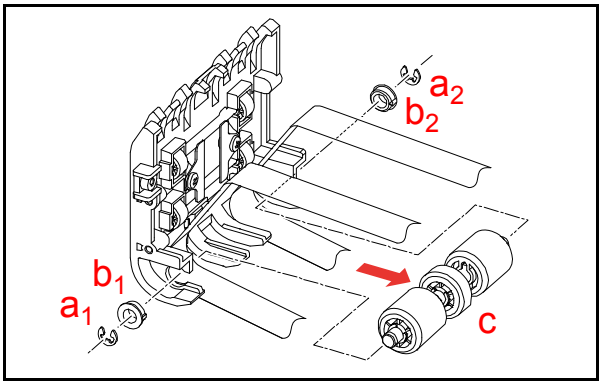


Figure 4-33 Rubber Pulley Unit Removal

4. Remove the three (3) E-Rings (Figure 4-34 a_1, a_2 & a_3), and then pull the two (2) Rubber Pulleys (Figure 4-34 b_1 & b_2), the single (1) Drive Roller (Figure 4-34 c) and the three (3) Parallel Pins (Figure 4-34 d_1, d_2 & d_3) out of the Shaft (Figure 4-34 e).

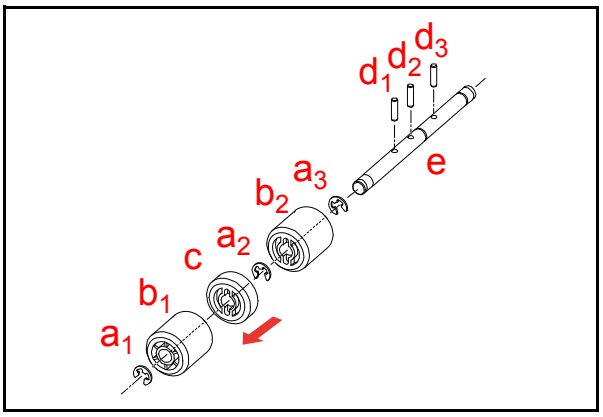


Figure 4-34 Rubber Pulley and Driver Roller Removal

Solenoid Removal

To remove the Solenoid, proceed as follows:

1. Remove the Solenoid (Figure 4-35 a) from the Lower Side Frame R (Figure 4-35 b).

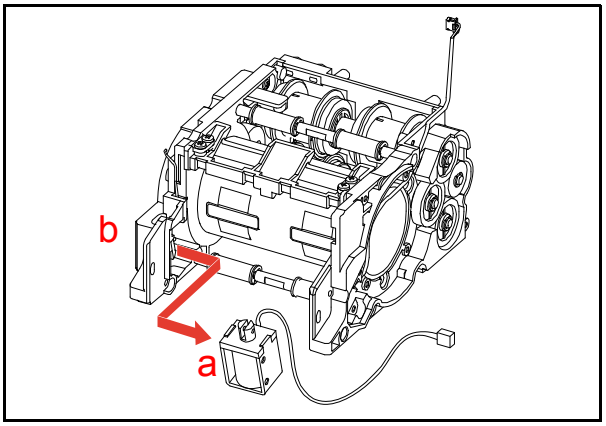


Figure 4-35 Solenoid Removal

NOTE: Unplug the Solenoid Plunger before removing the Solenoid.

Lower Unit Film and Film2 Removal

To remove the Film and Film2 from the Lower Unit, proceed as follows:

1. Remove the four (4) Mounting Screws (Figure 4-36 a_1 through a_4) retaining the Guide Course (Figure 4-36 b), and take the Guide Course off the Lower Unit.
2. Remove the two (2) Mounting Screws (Figure 4-36 c_1 & c_2) from both sides of the Lower Unit, and take the Front Frame (Figure 4-36 d) off the Lower Unit.

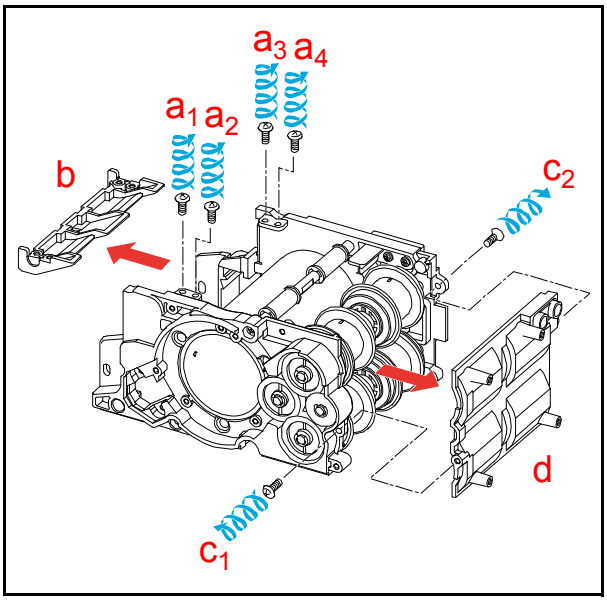


Figure 4-36 Guide Course and Front Frame Removal

3. Rotate the Handle Gear (Figure 4-37 a) clockwise and roll the Film until the Clip (Figure 4-37 b) attached to the Drum Unit appears.

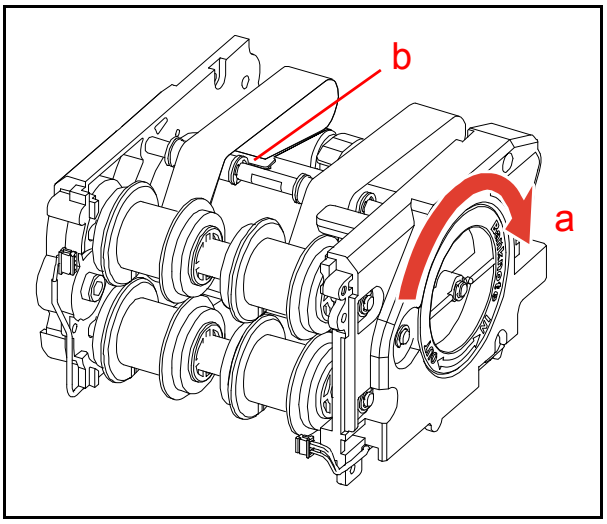


Figure 4-37 Film Rolling

4. Remove the single (1) E-Ring (Figure 4-38 a) retaining the Handle Gear (Figure 4-38 b), and then remove the Handle Gear, the single (1) Bushing (Figure 4-38 c) and the single (1) Parallel Pin (Figure 4-38 d).
5. Remove the single (1) E-Ring (Figure 4-38 e) retaining the Clutch Gear (Figure 4-38 f), and then remove the Clutch Gear, the single (1) Bushing (Figure 4-38 g) and the single (1) Poly Slider (Figure 4-38 h).
6. Remove the two (2) E-Rings (Figure 4-38 i_1 & i_2) and two (2) Bushings (Figure 4-38 j_1 & j_2) from the Rear Unit.

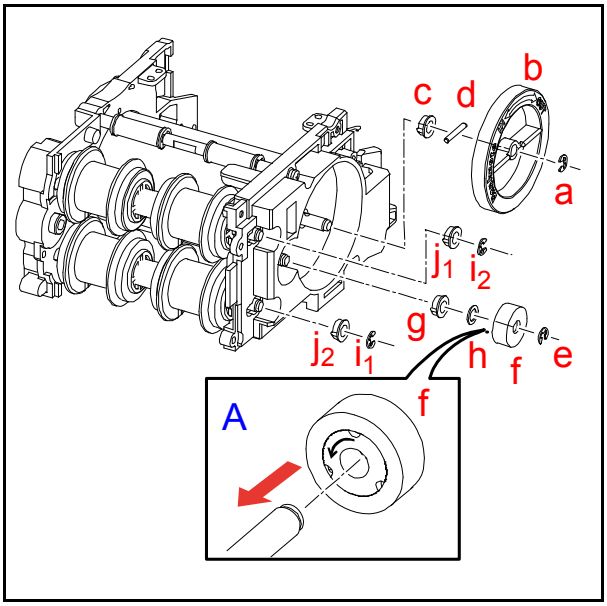


Figure 4-38 Handle Gear and Clutch Gear Removal

NOTE: When re-installing the Clutch Gear, the arrow die stamped side should face the Shaft, as indicated in illustration A.

7. Remove the two (2) Mounting Screws (Figure 4-39 a_1 & a_2) retaining the Lower Side Frame R (Figure 4-39 b), and take the Lower Side Frame R off the Rear Unit.

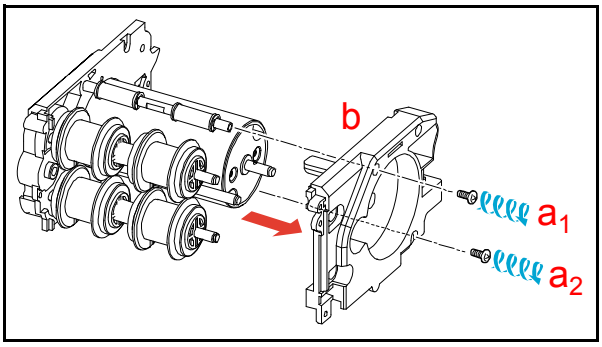


Figure 4-39 Upper Side Frame R Removal

8. Remove the two (2) E-Rings (Figure 4-40 a_1 & a_2) retaining each Film Bobbin Drive Gear (Figure 4-40 b_1 & b_2). Next, remove the two (2) Film Bobbin Drive Gears and the two (2) Parallel Pins (Figure 4-40 c_1 & c_2). Then remove the two (2) Frame Shaft Assemblies (Figure 4-40 d_1 & d_2).

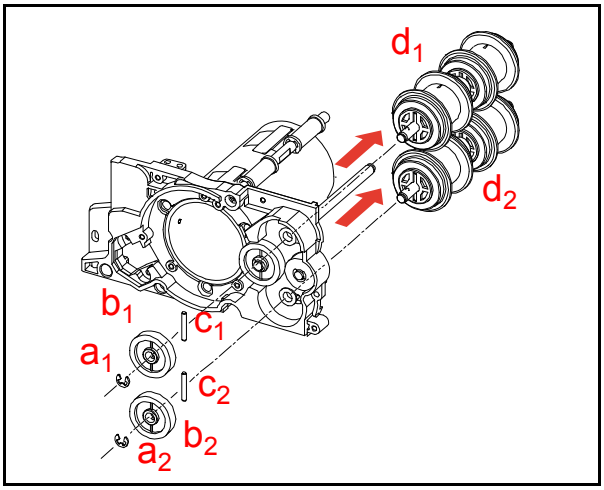


Figure 4-40 Frame Shaft Assembly Removal

9. Remove the two (2) Clips (Figure 4-41 a_1 & a_2) and the two (2) Films (Figure 4-41 b_1 & b_2) from the Main Drum.

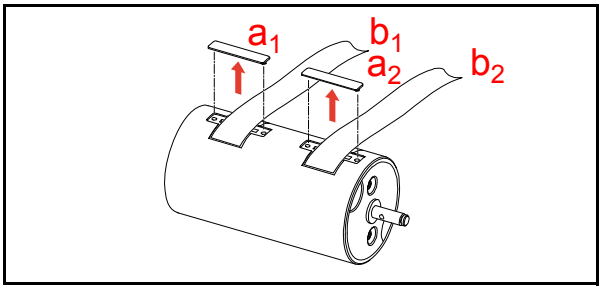


Figure 4-41 Clip Removal

10. Slide the Film Bobbins (Figure 4-42 a_1 & a_2) to the inside, and pull the single (1) Parallel Pin (Figure 4-42 b) out of the Shaft.
11. Separate the two (2) Film Bobbins from each other.

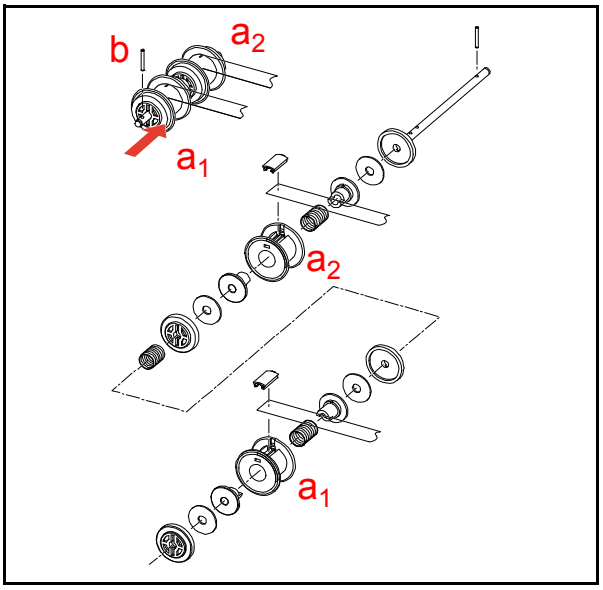


Figure 4-42 Film Bobbin Removal

NOTE: When rolling the Film back onto the Bobbin (Figure 4-43 a), be sure to rotate the Film in the direction indicated by the arrow printed on the Bobbin. When re-installing the Limit Kick Spring (Figure 4-43 b), insert one end of the spring into the hole located on the right side of the Film Bobbin Core (Figure 4-43 c). When reinstalled correctly, the Film and Film2 will automatically self-retract when gently pulled on. Review Film and Film2 Installation (below) for Film installation.

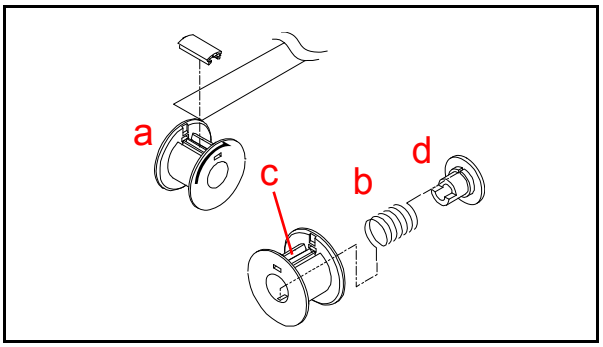


Figure 4-43 Frame Shaft & Limit Spring Assembly

Film and Film2 Installation

To replace the Film and Film2, proceed as follows:

1. Install the Frame Shaft Assembly (Figure 4-44 a_1 through a_4) with the Film and Film2 replaced in the VEGA-RC Twin Unit.

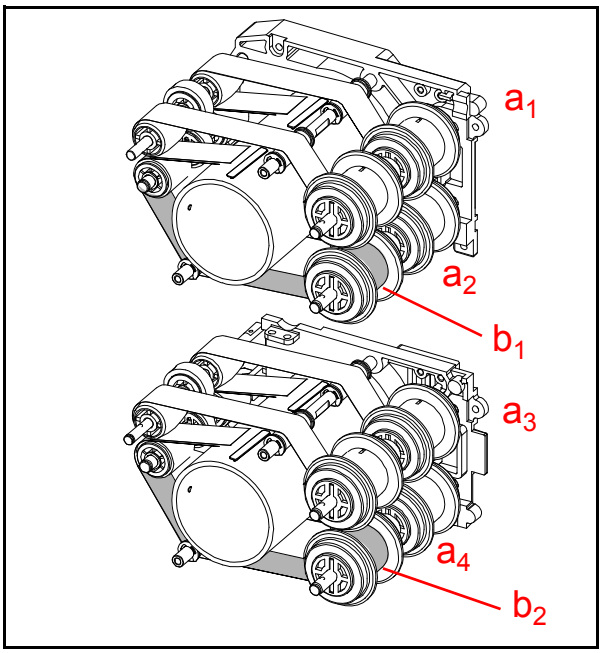


Figure 4-44 Frame Shaft Assembly Installation

NOTE: Be sure to install the Black Edged Film onto the correct Bobbins (Figure 4-44 b_1 & b_2) as indicated in Figure 4-44.

2. Route the Film from the Frame Shaft to the Main Bobbin, as shown in Figure 4-45.
3. Reattach the ends of the Films to the Main Bobbin using the Retainer Clips (Figure 4-45 b_1 & b_2).

NOTE: Ensure that the Film edges are sealed to the Drums with the double stick tapes before reattaching the Retainer Clips.

NOTE: Ensure that the edge of the Films are flush with one another.

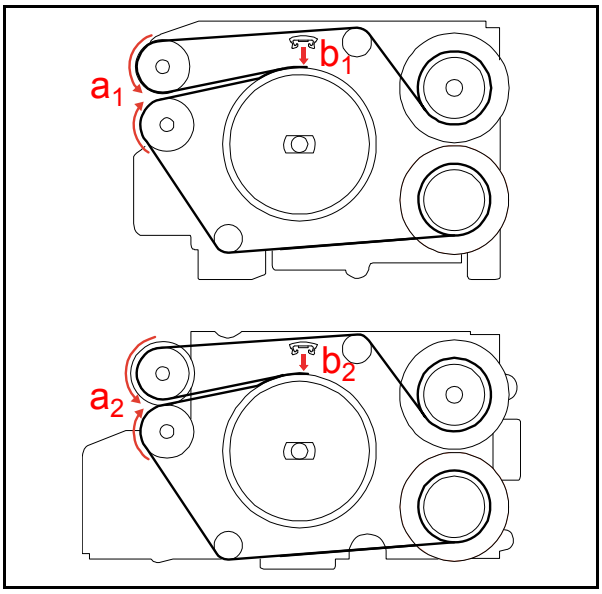


Figure 4-45 Film and Film2 Installation

VEGA-RC Twin™ Series
Banknote Recycler
Section 5

5 WIRING DIAGRAMS

This chapter provides the VEGA-RC Twin™ Series Banknote Recycler Unit Wiring Diagrams.

- VEGA-RC Twin System(12V)
- VEGA-RC Twin System (24V)

VEGA-RC Twin System Wiring Diagram (12V)

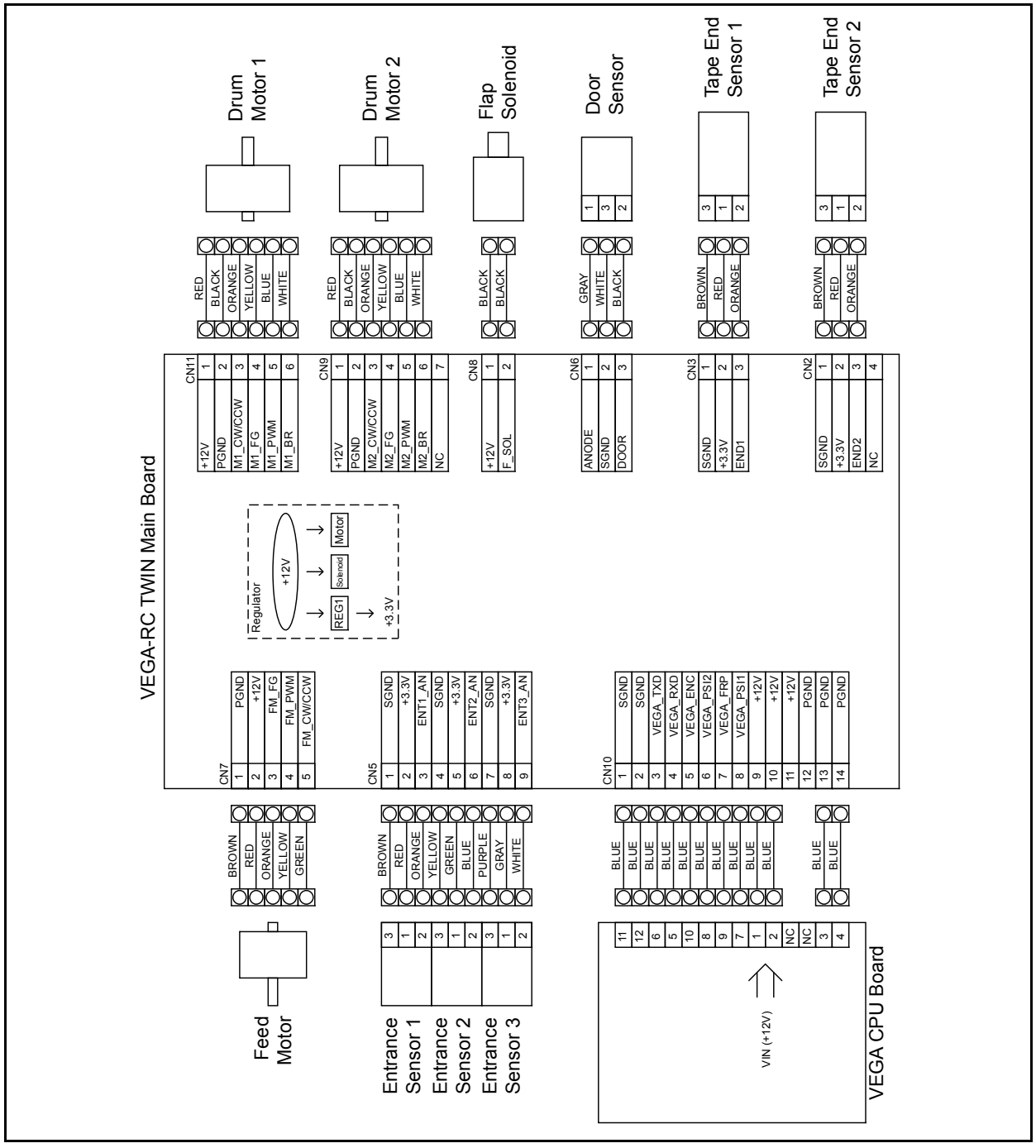


Figure 5-1 VEGA-RC Twin System Wiring Diagram (12V)

VEGA-RC Twin System Wiring Diagram (24V)

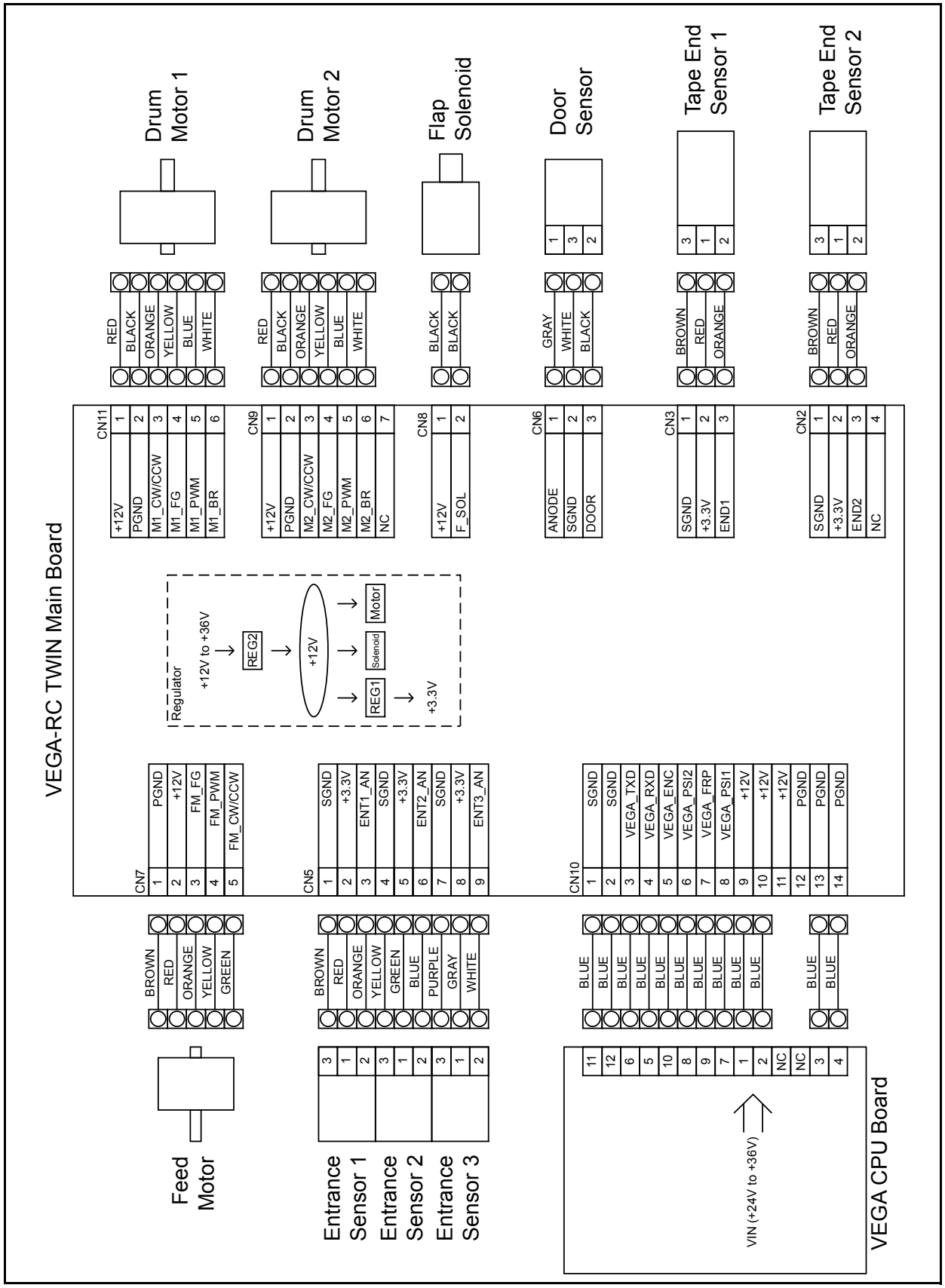


Figure 5-2 VEGA-RC Twin System Wiring Diagram (24V)

VEGA-RC Twin™ Series
Banknote Recycler
Section 6

6 PERFORMANCE TESTS

This section provides Performance Testing instructions for the VEGA-RC Twin™ Series Banknote Recycler Unit. This section contains the following information:

- Workbench Tool Requirements
- Performance Test Mode (Recycling/Aging Tests)
- Monitoring Tool Installation
- Test Mode (Test Items and Test Purposes)

Workbench Tool Requirements

Figure 6-1 lists the Workbench Tools and Cables, and illustrates the connections between them.

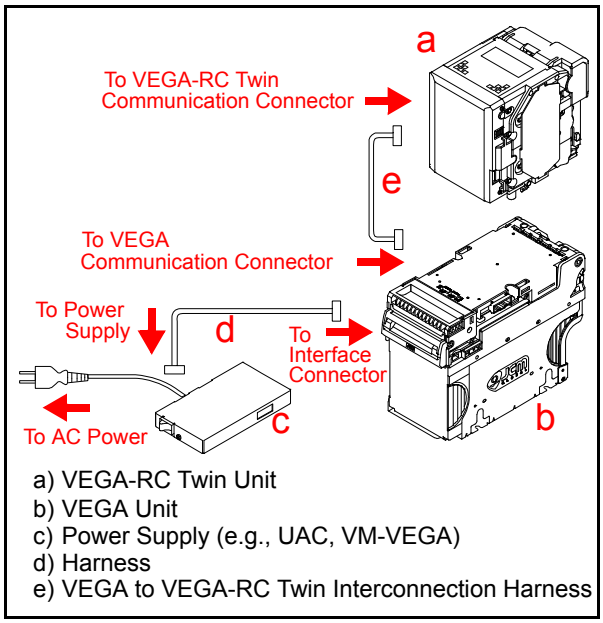


Figure 6-1 VEGA & VEGA-RC Test Connections

Performance Test Mode

The VEGA-RC Twin supports the following Performance Tests:

- Recycling Test
- Aging Test

These tests are performed to check proper operation of the VEGA-RC Twin Recycling and Aging movement. This section identifies:

- The VEGA Unit's **DS1 (DIP Switch Block 1)** settings for entering Performance Test Mode (Figure 6-2 and Figure 6-3); and
- The VEGA Unit's **DS2 (DIP Switch Block 2)** settings for each Performance Test (Figure 6-4 and Figure 6-5).

Performance Test Procedure

To perform each test, proceed as follows:

1. Disconnect the VEGA Unit's power supply (Figure 6-1 c). Power must be OFF.
2. Set the VEGA Unit's DS1 for the desired test setting (Figure 6-2 or Figure 6-3):
   Recycling Test: Switch #1, #3 and #5 to ON
   Aging Test: Switch #1, #3, #5 and #6 to ON.

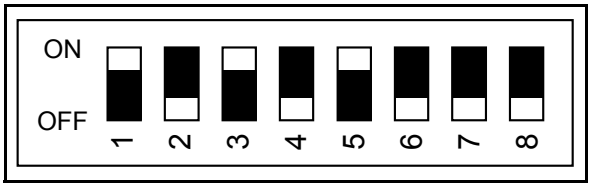


Figure 6-2 Recycling Test - DS1 Setting

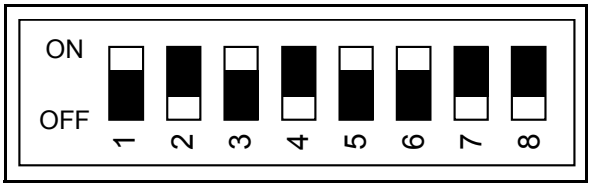


Figure 6-3 Aging Test - DS1 Setting

3. Set the VEGA Unit's DS2 for the desired test setting (Figure 6-4 or Figure 6-5):
   Recycling Test: All Switches OFF.
   Aging Test: Switch #5 to ON.

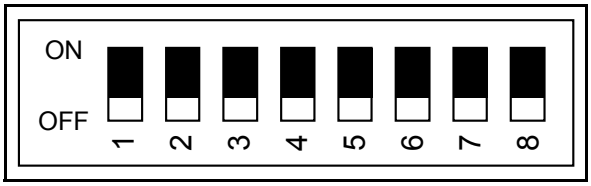


Figure 6-4 Recycling Test - DS2 Setting

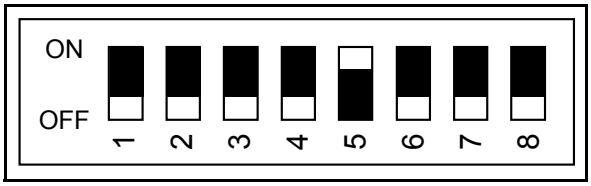


Figure 6-5 Aging Test - DS2 Setting

4. Reconnect the VEGA Unit's power supply (Figure 6-1 c) to restore power to the VEGA-RC Twin Unit. The VEGA-RC Twin begins initial movement and the Two-color LED indicators flash a Green and a Red color at a 0.5 second interval rate.
5. Following initialization, verify that the Two-color LED indicators appear as a solid Green color. (The machine will be in Stand-by mode.)

6. Set DS1 switch #1 on the VEGA Unit to OFF. The VEGA Unit begins initial movement.
7. Insert the Banknotes into the VEGA Unit's Insertion Slot.
8. Verify each test movement.
   - **Recycling Test**: Verify that the correct denomination Banknotes are stored in the Upper Drum and Lower Drum (as specified through the Host machine), and that other denomination Banknotes are stored in the VEGA Unit's Cash Box.

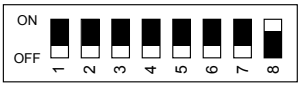
     NOTE: The Banknotes stored in each Drum will not be dispensed or retrieved when the Status is Full.
   - **Aging Test**: Verify that the stored Banknotes in the VEGA-RC Twin Unit are transported between the Upper and Lower Drums and returned; the first Banknote inserted into the VEGA Unit's Insertion Slot is routed to the Lower Drum, then returned. A second inserted Banknote is routed to the Upper Drum and returned, with subsequent Banknotes alternating between Drums, accordingly.

     NOTE: When DS2 Switch #2 is set to ON, the VEGA-RC Twin Unit switches to force Storing Mode, with all Banknotes being dispensed when each Drum is full.

Additional Settings

There are additional settings to change the Test Condition or Test Mode for the Recycling and Aging Tests. These settings can be added after the VEGA Unit's DS2 is set for each test (See Step 3 of "Performance Test Procedure" on page 6-1). Table 6-1 lists the VEGA-RC Twin Performance Test additional settings.

Table 6-1 Additional Settings

Mode & Additional DIP Switch Setting	Setting Confirmation
Non-Validation (for Recycling) DS2, #8 = ON 	Insert script or test notes into the VEGA Unit's Insertion Slot, and then verify that the VEGA Unit enters Non-Validation Mode.
Non-Validation (for Aging) DS2, #5 and 8 = ON 	In Non-Validation (for Recycling) Mode, all documents are routed to the Lower Drum until it is full, then routed to the Cash Box.
10 Second Interval Transportation (for Aging) DS2, #5 and 6 = ON 	Confirm that the stored Banknotes in the VEGA-RC Twin Upper and Lower Drums start transporting between each drum in 10-second intervals (i.e., a subsequent Banknote can be inserted into the Insertion Slot).

Self Test (Option)

To enter Test Mode, connect the Monitoring Tool to the VEGA-RC Twin Unit (Figure 6-8), and then supply power while pressing the SW1 Button. This section provides the definitions and operation for the Seven (7) Segment Display indications on the Monitoring Tool for the VEGA-RC Twin Recycler.

NOTE: The Monitoring Tool with Seven (7) Segment Display is required to perform the Self Test. The Monitoring Tool is an optional component available separately, and is not included with the VEGA-RC Twin Unit or the VEGA Unit.

Monitoring Tool Installation

To conduct the Self Test, a Monitoring Tool connected to the VEGA-RC Twin Unit is required. The Self Test status and test results are indicated on the Monitoring Tool Seven (7) Segment Display.

Perform the following steps to connect the Monitoring Tool to the VEGA-RC Twin Unit:

1. Locate the Connector Cover (Figure 6-6 a) on the right side of the VEGA-RC Twin Unit.

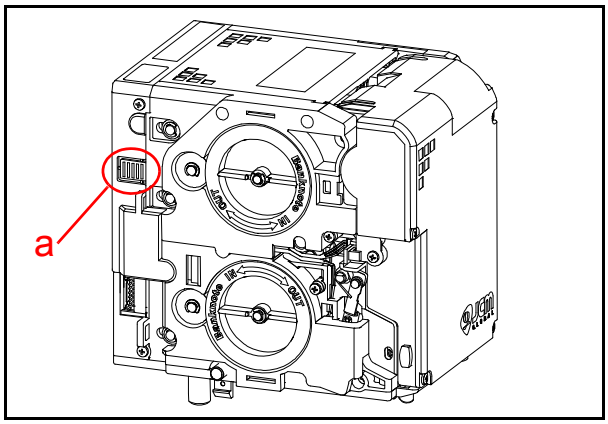


Figure 6-6 Connector Cover Location

2. Cut the three (3) tabs (Figure 6-7 a) retaining the Connector Cover (Figure 6-7 b).
3. Remove the Connector Cover and locate the connector (Figure 6-7 c) inside of the VEGA-RC Twin Unit.

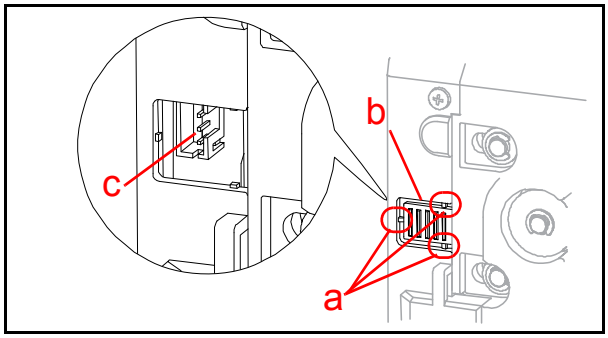


Figure 6-7 Connector Location

4. Connect the 4-Pin specified cable (Figure 6-8 a) to the connector of the VEGA-RC Twin Unit (Figure 6-8 b) and the Monitoring Tool (Figure 6-8 c).

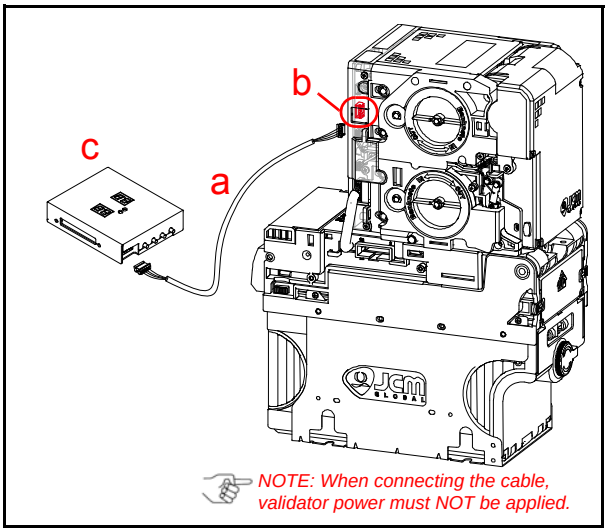
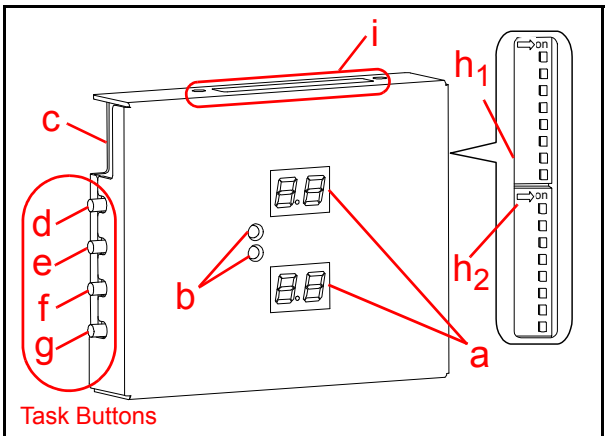


Figure 6-8 Cable Interconnection



a) 7 Segment Display (Upper and Lower)
b) LED Indicator (Red/Green)
c) VEGA Connector
d) SW1 Button (Indication Change Button)
e) SW2 Button (Dispense 2 Button)
f) SW3 Button (Dispense 1 Button)
g) SW4 Button (Retrieve Button)
h) DIP Switch
   h_1: DIPSW1 (Upper Block)
   h_2: DIPSW2 (Lower Block)
i) Connector (from left: CN1, CN3 and CN2)

Figure 6-9 Monitoring Tool Components

NOTE: The Monitoring Tool exterior design and specifications are subject to change without notice.

Test Mode

To enter VEGA-RC Twin Test Mode, make sure the Monitoring Tool is connected to the VEGA-RC Twin (Figure 6-8), then apply power to the VEGA while pressing the SW1 Task Button on the Monitoring Tool. The Seven (7) Segment Display will show T-00 when in Test Mode (Figure 6-10). See Table 6-2 below for the character conversion.

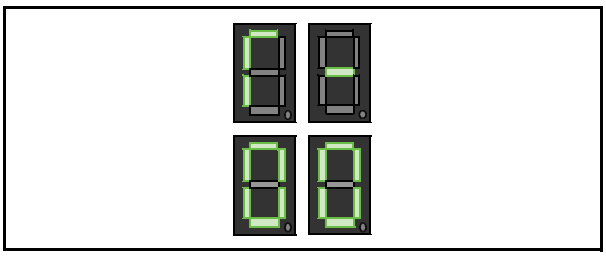


Figure 6-10 The Seven Segment Initial Indication

Table 6-2 Seven Segment Display Definitions

0	1	2	3	4	5	6	7	8	9	A	B	C	D
E	F	G	H	I	J	K	L	M	N	O	P	Q	R
S	T	U	V	W	X	Y	Z	Blank	@				

Table 6-3 list the various test items and test purposes.

Table 6-3 Various Test Items and Test Purposes

	Test Item		Test Purpose
1	Key Input	Task Button	Verify that each Task Button ON/OFF functions normally.
2		DIP Switch	Check that the DIPSW1 and DIPSW2 ON/OFF function normally.
3	Sensor and Flapper Movement	Positioning Sensor 1	Check that the Positioning Sensor 1 detects changes when opening the VEGA Unit's Upper Transport Path.
4		Positioning Sensor 2	Check that the Positioning Sensor 2 detects changes when removing the VEGA Unit's Rear Cover.
5		VEGA-RC Flapper	Check that the VEGA-RC Flapper Sensor detects changes when moving the VEGA Unit's Flapper.
6	A/D Value	Entrance Sensor	Verify the A/D Value when there is a Banknote/no Banknote on the Entrance Sensor 1, 2 and 3. Reference Value*: with Banknote = greater than 75H without Banknote = lower than 74H
7		Film End Sensor	Verify the A/D Value when the film is remaining/not remaining. Reference Value*: film remaining = greater than 50H no film remaining (film end) = lower than 49H
8		Full Detection Sensor	Verify the A/D Value when testing the Full Detection Sensor functionality. Reference Value*: full detection = greater than 50H no full detection = lower than 49H
9	Drum Motor	Lower Drum Motor	Check that the Lower Drum performs normal/reverse rotation correctly.
10		Upper Drum Motor	Check that the Upper Drum performs normal/reverse rotation correctly.
11	Transport Motor	Transport Motor	Check that the Transport Belt in the rear section performs normal/reverse rotation correctly.
12		Solenoid	Check that the Flapper in the rear section functions open/close.
13	Transport Film Dirt Check		Verify the Upper and the Lower Drums' A/D Value. Reference Value*: Both Drums A/D Value is greater than 75H

*. Reference Values; Test results (displayed values) may vary, depending on each sensor's condition.

Key Input Test

This test verifies that the DIPSW1 and DIPSW2 DIP Switches and Task Buttons on the VEGA-RC Twin Monitoring Tool operate correctly.

TASK BUTTONS

To verify that the Task Buttons function correctly:

1. Make sure the VEGA-RC Twin unit is in Test Mode, with T-00 appearing on the Monitoring Tool Seven (7) Segment Display (Figure 6-10).
2. Press the SW1 Task Button to display T5-01 (Switch Test #5, SW1 Enabled).

   NOTE: Press and hold SW1 for 3 seconds to exit the test and return to the T-00 Initial Indication display.

3. Press the SW2, SW3 and SW4 Task Buttons to display results, as shown in Table 6-4.

DIPSW1/DIPSW2 DIP SWITCHES

To test the DIP Switch Banks:

1. Make sure the VEGA-RC Twin unit is in Test Mode, with T-00 appearing on the Monitoring Tool Seven (7) Segment Display (Figure 6-10).
2. Press the SW1 Task Button to display T5-01 (Switch Test #5, SW1 Enabled).
3. Toggle all switches on DIPSW1 and DIPSW2. The weighted value of each switch will be displayed (see Table 6-4 and the following NOTE).

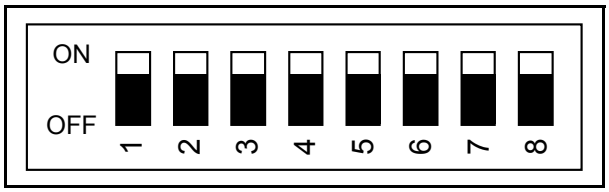


Figure 6-11 DIPSW1 and DIPSW2 All ON

NOTE: DIPSW1 and DIPSW2 operate independently, and display values ranging from "00" (with all Switches OFF) to "FF" (all Switches ON). The displayed value is updated in real time as each Switch on the DIP Switch block is turned ON or OFF.

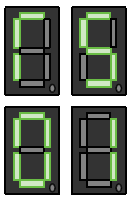
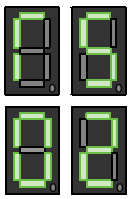
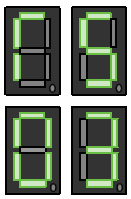
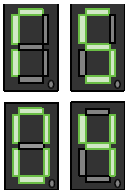
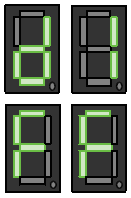
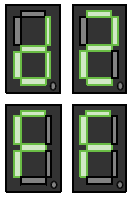
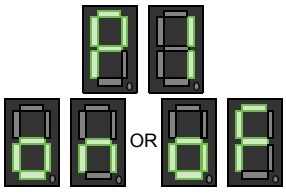
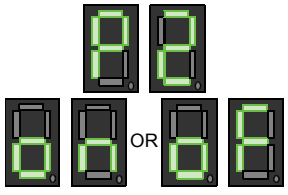
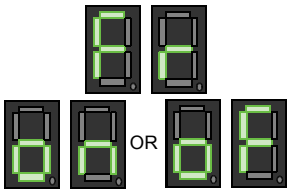
Individual DIP Switches on each block are numerically weighted as shown below, with the value added to or subtracted from the displayed value as each Switch is turned to ON or OFF.

- Switch 1 = 1
- Switch 2 = 2
- Switch 3 = 4
- Switch 4 = 8
- Switch 5 = 10
- Switch 6 = 20
- Switch 7 = 40
- Switch 8 = 80

INDICATION CONFIRMATION

The Seven (7) Segment Display provides a variety of indications used to interpret test conditions. Table 6-4 lists confirmation indications for each test.

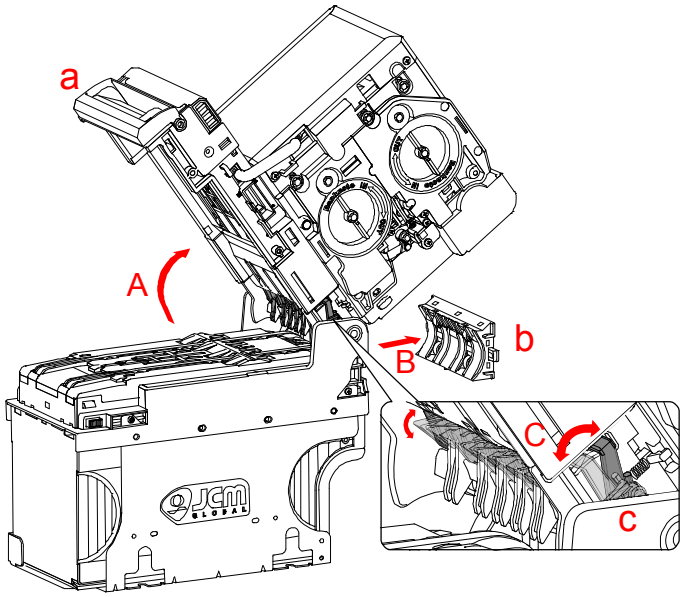
Table 6-4 VEGA-RC Twin Various Indications

SW1	SW2	SW3	SW4
			
DIPSW1	DIPSW2	Positioning Sensor 1	Positioning Sensor 2
			
VEGA-RC Flapper			
			

Sensor and Flapper Test

This test is performed to make sure that the VEGA Positioning Sensor 1, Positioning Sensor 2 and the Flapper ON and OFF functions work properly (Review Table 6-4 “VEGA-RC Twin Various Indications” on page 6-5 in this Section for details). Table 6-5 lists the sensors and movement location to confirm.

Table 6-5 Sensor and Flapper Test Movement and Location



Sensor and Movement

POSITIONING SENSOR 1

Press the “SW1” button while the Seven (7) Segment Indication Display is in Initial indication mode (Figure 6-10). “TS-01” will be displayed. Next, open the VEGA Unit’s Transport Part (a) as indicated by red arrow A in the illustration. When the PS1 Sensor is activated, the P1 display indicates “on” or “oF” status of P1 (Table 6-4).

- P1 on = VEGA Transport Cover closed
- P1 oF = VEGA Transport Cover open.

POSITIONING SENSOR 2

Press the “SW1” button while the Seven (7) Segment Indication Display is in Initial indication mode (Figure 6-10). “TS-01” will be displayed. Next, open the VEGA Unit’s Rear Cover (b) as indicated by red arrow B in the illustration. When the PS2 Sensor is activated, the P2 display indicates “on” or “oF” status of P2 (Table 6-4).

- P2 on = VEGA Rear Cover removed
- P2 oF = VEGA Rear Cover replaced (installed).

FLAPPER

Press the “SW1” button while the Seven (7) Segment Indication Display is in Initial indication mode (Figure 6-10). “TS-01” will be displayed. Next, move the VEGA Unit’s Flapper Lever (c) as indicated by red arrow C in the illustration. When the VEGA-RC Sensor is activated, the Fr display indicates “on” or “oF” status of Fr (Table 6-4).

- Fr on = VEGA Upper Flap moved outward
- Fr oF = VEGA Upper Flap Home Position.

A/D Value Indication Test

Entrance Sensor 1

To run the Entrance Sensor 1 A/D Value Indication Test on the VEGA-RC Twin, proceed as follows:

1. With the Test Mode Initial Indication T-00 displayed (Figure 6-10), press the SW2 button. T-01 should be displayed.
2. Press the SW1 button (Review Figure 6-9 d) once while the Seven (7) Segment Indication Display appears as shown in Figure 6-12a. The VEGA-RC Twin switches to Entrance Sensor 1 A/D Value Indication Mode. The Upper LED displays a Flashing Green color during the test.

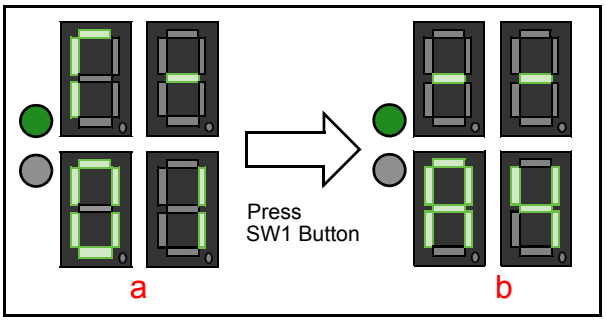


Figure 6-12 Entrance Sensor 1

3. Confirm that the Seven (7) Segment Indication Display shows the A/D Value in hexadecimal numbers (Figure 6-12 b).
4. Press and hold the SW1 button (Review Figure 6-9 d) for three (3) seconds to exit the Test Mode.

Entrance Sensor 2 and 3

To run the Entrance Sensor 2 and 3 A/D Value Indication Test on the VEGA-RC Twin, proceed as follows:

1. With the Test Mode Initial Indication T-00 displayed (Figure 6-10), press the SW2 button twice to display T-02.
2. Press the SW1 button (Review Figure 6-9 d) once while the Seven (7) Segment Indication Display appears as shown in Figure 6-13a. The VEGA-RC Twin switches to **Entrance Sensor 2 and 3 A/D Value Indication Mode**. The Upper LED displays a Flashing Green color during the test.
3. Confirm that the Seven (7) Segment Indication Display shows the A/D Value in hexadecimal numbers for ES2 and ES3 (Figure 6-13 b).

NOTE: Displayed values may vary.

4. Press and hold the SW1 button (Review Figure 6-9 d) for three (3) seconds to exit the Test Mode.

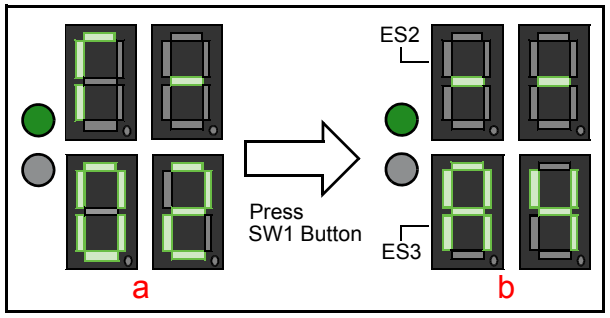


Figure 6-13 Entrance Sensor 2 and 3

Upper and Lower Film End Sensor

To run the Upper and Lower Film End A/D Value Test on the VEGA-RC Twin, proceed as follows:

1. With the Test Mode Initial Indication T-00 displayed (Figure 6-10), press the SW2 button (Review Figure 6-9 e) three times to display T-03.
2. Press the SW1 button (Review Figure 6-9 d) once while the Seven (7) Segment Indication Display appears as shown in Figure 6-14a. The VEGA-RC Twin switches to the Upper and Lower Film End Sensor A/D Value Indication Mode. The Upper LED displays a Flashing Green color during the test.
3. Confirm that the Seven (7) Segment Indication Display shows the A/D Value in hexadecimal numbers (Figure 6-14 b).

NOTE: Displayed values may vary.

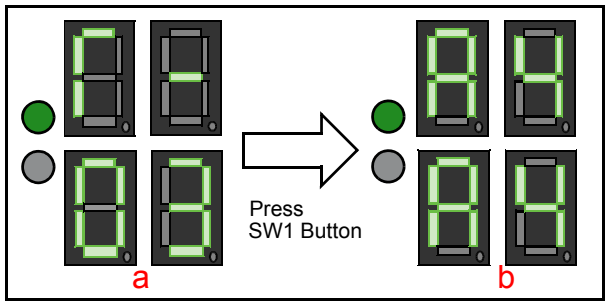


Figure 6-14 Upper and Lower Film End Sensor

4. Press and hold the SW1 button (Review Figure 6-9 d) for three (3) seconds to exit the Test Mode.

Upper and Lower Full Detection Sensor

To run the Upper and Lower Full Detection Sensor A/D Value Indication Test on the VEGA-RC Twin, proceed as follows:

1. With the Test Mode Initial Indication T-00 displayed (Figure 6-10), press the SW2 button (Review Figure 6-9 e) four times to display T-04.
2. Press the SW1 button (Review Figure 6-9 d) once while the Seven (7) Segment Indication Display appears as shown in Figure 6-15a. The VEGA-RC Twin switches to the Upper and Lower Full Detection Sensor A/D Value Indication Mode. The Upper LED displays a Flashing Green color during the test.

3. Confirm that the Seven (7) Segment Indication Display shows the A/D Value in hexadecimal numbers (Figure 6-15 b).

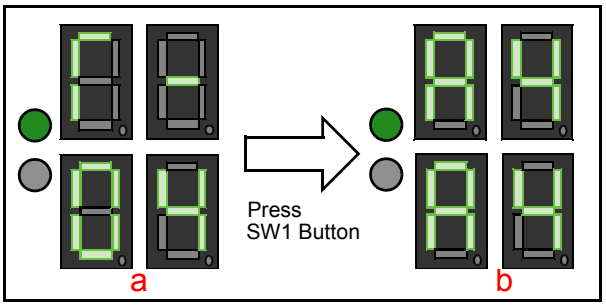


Figure 6-15 Upper and Lower Full Detection Sensor

4. Press and hold the SW1 button (Review Figure 6-9 d) for three (3) seconds to exit the Test Mode.

Motor Test

This test is performed to make sure that the Upper and Lower Drum Motors and the Transport Drum Motor work properly.

The SW3 Button (Figure 6-9 f) can be used to change the motor rotation from forward to reverse and back again.

- If LED 1 is solid GREEN, the motor is set to run in Forward direction.
- If LED 2 is solid RED, the motor is set to run in Reverse direction.

During the Motor Test, LED 1 or LED 2 will flash, depending on the setting selected using the SW3 button.

When running the Motor Test, note that the Motor starts from whatever point the Recycler Film is at, and runs in the selected direction (Forward/Normal or Reverse rotation), stopping when the film reaches the end. If the test duration ends abruptly, press the SW3 button to reverse the Recycler Film direction, then rerun the test to ensure accurate test results.

Lower Drum Motor Test

To run the Lower Drum Motor Normal Rotation Test on the VEGA-RC Twin, proceed as follows:

1. With the Test Mode Initial Indication T-00 displayed (Figure 6-10), press the SW2 button (Review Figure 6-9 e) five times to display T-05.
2. Press the SW1 button (Review Figure 6-9 d) once while the Seven (7) Segment Indication Display appears as shown in Figure 6-16a.
3. Press the “SW2” button once to begin the Lower Drum Normal Rotation. (Figure 6-16 b).

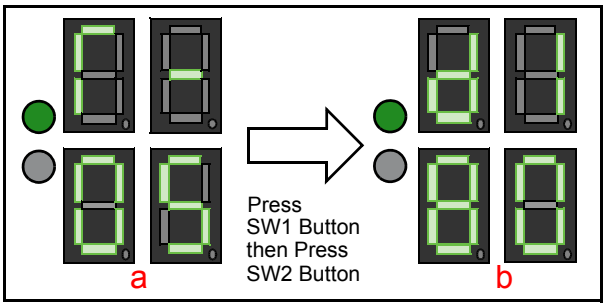


Figure 6-16 Lower Drum Motor Test (Normal)

NOTE: When the Test starts, the display changes from 'd1-80' (where d1=Lower Drum and 80=the Duty Cycle default value) to 'd1-1' while the Motor runs. When the Recycler Film reaches its end, the Motor stops and the display changes to '80-1.'

To run the Lower Drum Motor Reverse Rotation Test on the VEGA-RC Twin, proceed as follows:

1. Press the SW3 button (Review Figure 6-9 f) once while the Seven (7) Segment Indication Display appears with the Lower Drum Normal Rotation indicator illuminated, as shown in Figure 6-17a. The Lower LED displays a solid red color.
2. Press the SW2 button (Review Figure 6-9 e) once to begin the Lower Drum Reverse Rotation (Figure 6-17 b).

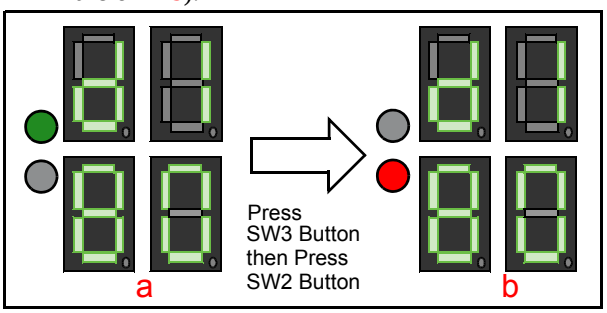


Figure 6-17 Lower Drum Motor Test (Reverse)

In addition, when pressing the SW4 button while showing the Normal Rotation Indication (Figure 6-18 a), the duty cycle is increased by one (1) (Figure 6-18 b).

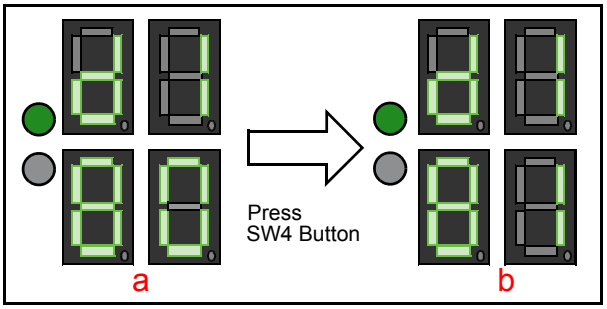


Figure 6-18 Lower Drum Motor Test Duty Cycle Increase

NOTE: Press and hold the SW4 button for three (3) seconds to increase the Duty Cycle by ten (10).

When pressing the SW1 button (Review Figure 6-9 d) once while the Lower Motor is running, the movement will stop. Press and hold the SW1 button for three (3) seconds to terminate the Test.

Upper Drum Motor Test

To run the Upper Drum Motor Normal Rotation Test on the VEGA-RC Twin, proceed as follows:

1. With the Test Mode Initial Indication T-00 displayed (Figure 6-10), press the SW2 button (Review Figure 6-9 e) six times to display T-06.
2. Press the SW1 button (Review Figure 6-9 d) once while the Seven (7) Segment Indication Display appears as shown in Figure 6-19 a.

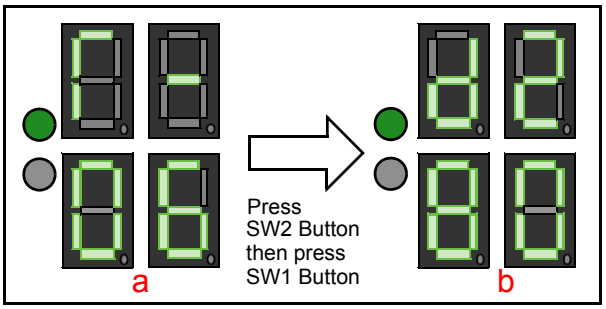


Figure 6-19 Upper Drum Motor Test (Normal)

3. Press the SW2 button once to begin the Upper Drum Normal Rotation. (Figure 6-19 b).

NOTE: When the Test starts, the display changes from 'd2-80' (where d2=Upper Drum and 80=the Duty Cycle default value) to 'd2-2' while the Motor runs. When the Recycler Film reaches its end, the Motor stops and the display changes to '80-2.'

To run the Upper Drum Motor Reverse Rotation Test on the VEGA-RC Twin, proceed as follows:

1. Press the SW3 button (Review Figure 6-9 f) once while the Seven (7) Segment Indication Display appears with the Upper Drum Normal Rotation indicator illustrated, as shown in Figure 6-20 a. The Lower LED displays a solid red color.
2. Press the SW2 button (Review Figure 6-9 e) once to begin the Upper Drum Reverse Rotation (Figure 6-20 b).

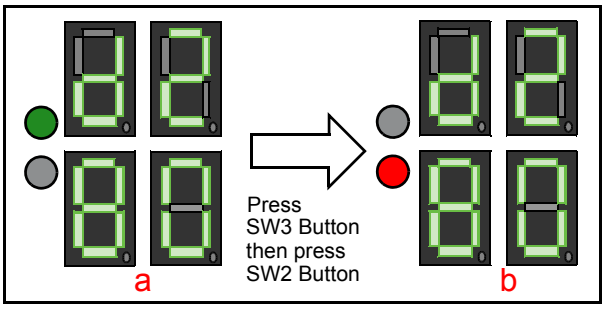


Figure 6-20 Upper Drum Motor Test (Reverse)

In addition, when pressing the SW4 button while showing the Normal Rotation Indication (Figure 6-21 a), the duty cycle is increased by one (1) (Figure 6-21 b).

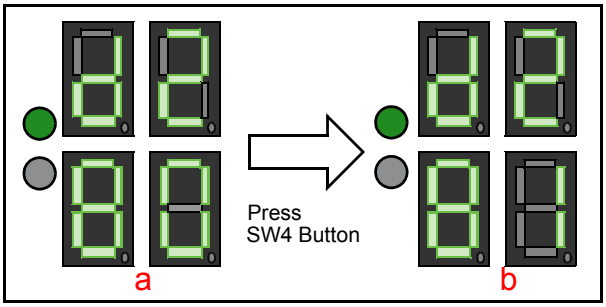


Figure 6-21 Upper Drum Motor Test Duty Cycle Increase

NOTE: Press and hold the SW4 button for three (3) seconds to increase the Duty Cycle by ten (10).

When pressing the SW1 button (Review Figure 6-9 d) once while the Upper Motor is running, the movement will stop. Press and hold the SW1 button for three (3) seconds to terminate the Test.

Transport Motor and Solenoid Test

This test checks the Transport Motor's ability to drive the belts on the Recycler's rear door forward and backward, and verifies operation of the solenoid that actuates the Flaps at the rear of the Recycler.

When executed, the Transport Motor drives the two belts located on the rear door of the Recycler. While running this test, the Recycler rear door may be opened to observe the movement of the belts without causing a test error. The motor continues to run until the test is terminated by pressing the SW1 button (Figure 6-9 d). The SW3 button (Figure 6-9 f) can be used to change the motor rotation from forward to reverse and back again.

- If LED 1 is solid GREEN, the motor is set to run in Forward/Normal direction.
- If LED 2 is solid RED, the motor is set to run in Reverse rotation.

During the Motor Test, LED 1 or LED 2 will flash, depending on the setting selected using the SW3 button.

TRANSPORT MOTOR TEST

To run the Transport Motor Normal Rotation Test on the VEGA-RC Twin, proceed as follows:

1. With the Test Mode Initial Indication T-00 displayed (Figure 6-10), press the SW2 button (Review Figure 6-9 e) seven times to display T-07.
2. Press the SW1 button (Review Figure 6-9 d) once while the Seven (7) Segment Indication Display appears as shown in Figure 6-22a.
3. Press the SW2 button once to begin the Transport Motor Normal Rotation Test. (Figure 6-22 b).

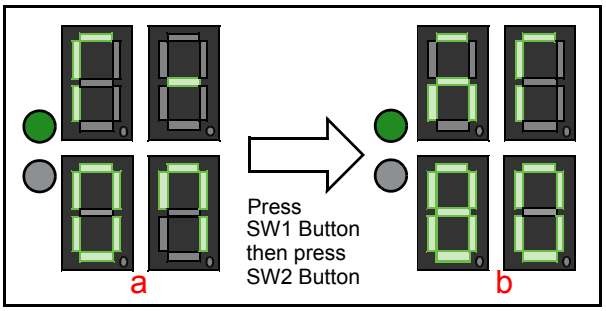


Figure 6-22 Transport Motor Test (Normal)

NOTE: When the Motor Test starts, the display changes from 'MT-80' (where MT=Transport Motor and 80=the Duty Cycle default value) to 'MT-3' while the Motor runs. When the SW1 button is pressed, the Motor stops and the display changes back to 'MT-80.'

To run the Transport Motor Reverse Rotation Test on the VEGA-RC Twin, proceed as follows:

1. Press the SW3 button (Review Figure 6-9 f) once while the Seven (7) Segment Indication Display appears with the Transport Motor Normal Rotation indicator illuminated, as shown in Figure 6-23a. The Lower LED displays a solid red color.
2. Press the SW2 button (Review Figure 6-9 e) once to begin the Transport Motor Reverse Rotation (Figure 6-23 b).

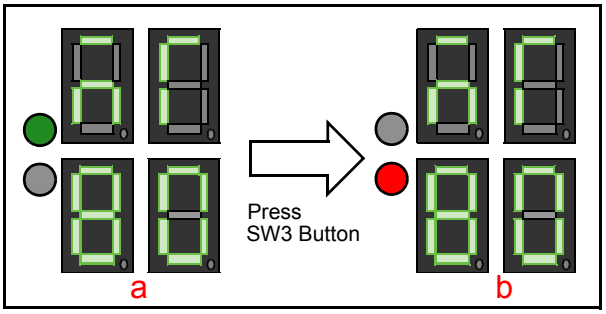


Figure 6-23 Transport Motor Test (Reverse)

In addition, when pressing the SW4 button (Figure 6-9 g) while the Normal Rotation Indication is displayed (Figure 6-24 a), the Duty Cycle is increased by one (1) (Figure 6-24 b).

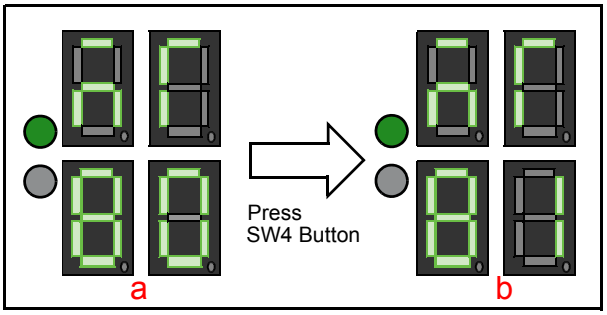


Figure 6-24 Transport Motor Test Duty Cycle Increase

NOTE: Press and hold the SW4 button for three (3) seconds to increase the Duty Cycle by ten (10).

When pressing the SW1 button (Review Figure 6-9 d) once while the Transport Motor is running, the movement will stop. Press and hold the SW1 button for three (3) seconds to terminate the Test.

SOLENOID TEST

While performing the Transport Motor Test, Solenoid performance can be tested at the same time. To run the Solenoid Test, proceed as follows:

1. Open the Rear Course (Figure 6-25) while the Seven (7) Segment Display appears as shown in Figure 6-26a.

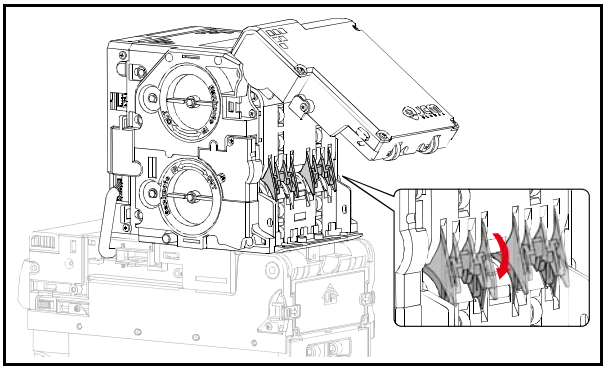


Figure 6-25 Rear Course Open

2. Press the SW1 button twice (Review Figure 6-9 d) to verify the Solenoid movement (shown in Figure 6-25 detail and Figure 6-26 b).

NOTE: Displayed values may vary.

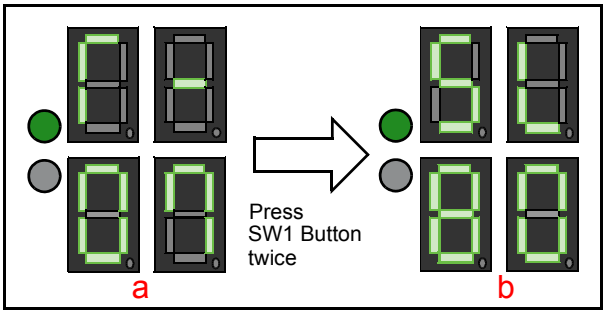


Figure 6-26 Solenoid Test

Transport Film Dirt Check

To check dirt on the Transport Film of the VEGA-RC Twin, proceed as follows:

NOTE: Before performing the Transport Film Dirt Check procedure, make sure no Banknotes remain in the VEGA-RC Twin Transport Path.

1. With the Test Mode Initial Indication T-00 displayed (Figure 6-10), press the SW2 button (Review Figure 6-9 e) nine times to display T-09 for the Lower Transport Film, and ten times to display T-10 for the Upper Transport Film.
2. Press the SW1 button (Review Figure 6-9 d) once to begin each Transport Film Dirt Check (Figure 6-27).

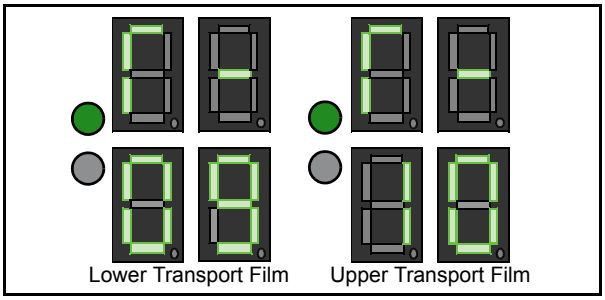


Figure 6-27 Upper and Lower Transport Film Dirt Check

The Transport Film Dirt Check takes approximately one (1) to two (2) minutes. After pressing the SW1 button to begin the Transport Film Dirt Check, 'IN IT' will be displayed while the VEGA-RC Twin initializes. During the test, 'T-09' or 'T-10' will be displayed, depending on the Film Transport that is being checked.

When the Transport Film Dirt Check ends, the display indicates "FM XX" (where XX = the A/D Hex value representing how dirty the Film may be). For this test, the threshold for dirt has been set at 60 Hexadecimal. If the displayed A/D Value is less than 60H, the operational conditions of the Transport Belts are degraded due to dirt or dirt build-up, and should be replaced.

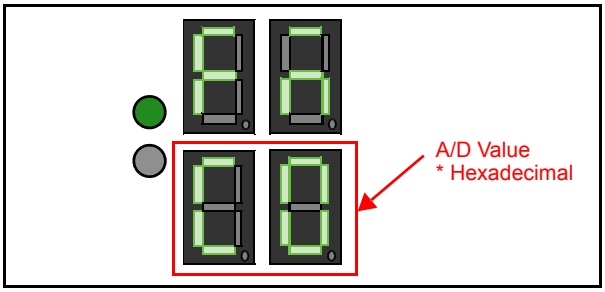


Figure 6-28 Upper and Lower Transport Film Dirt Check Result

NOTE: Reset the VEGA Power to stop the Transport Film Dirt Check.

THIS PAGE INTENTIONALLY LEFT BLANK

VEGA-RC Twin™ Series
Banknote Recycler
Section 7

7 EXPLODED VIEWS AND PARTS LISTS

This section provides product exploded views and parts lists for the VEGA-RC Twin™ Series Banknote Recycler Unit. This section contains the following information.

NOTE: Parts may be changed for improvement without notice.

- Entire VEGA-RC Twin Unit with Cover
- Entire VEGA-RC Twin Unit
- VEGA-RC Twin Upper and Rear Unit
- VEGA-RC Twin Rear Unit
- VEGA-RC Twin Upper Unit
- VEGA-RC Twin Lower Unit
- VEGA-RC Twin Upper Course Assembly
- VEGA-RC Twin Lower Course Assembly
- VEGA-RC Twin Upper and Lower Drum Unit
- VEGA-RC Twin Shaft Assembly
- VEGA-RC Twin Guide Roller Assembly
- VEGA-RC Twin Rubber Pulley Assembly
- VEGA-RC Twin Bottom Unit

Entire VEGA-RC Twin Unit with Cover Exploded View

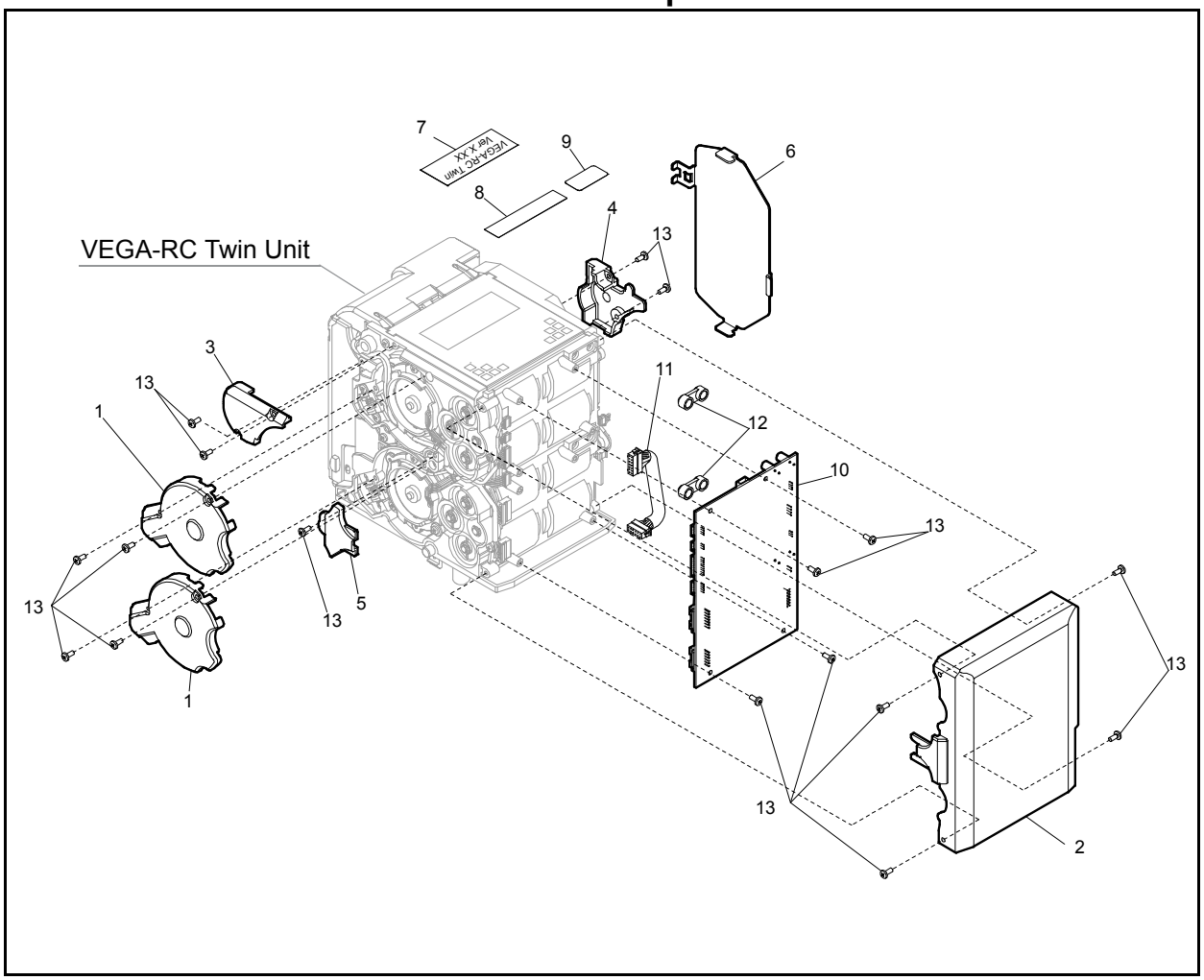


Figure 7-1 Entire VEGA-RC Twin Unit with Cover Exploded View

Entire VEGA-RC Twin Unit with Cover Parts List

Table 7-1 Entire VEGA-RC Twin Unit with Cover Parts List

Ref No.	EDP No.	Description	Qty	Remark
1	216058	Motor Set Cover	2	
2	216068	Front Cover	1	
3	216080	Fulcrum Cover	1	
4	216081	Solenoid Harness Cover	1	
5	216082	Harness Cover	1	
6	216051	Gear Cover	1	
7	218830	Rating Label	1	
	216178	Rating Label 24	1	For 24V Specification
8	218831	Soft Version Seal	1	
9	049384	Barcode Label	1	
10	215631	Main Board	1	
	215650	Main Board 24	1	For 24V Specification
11	216716	VEGA Harness	1	
12	144779	Sensor Lens	2	
13	104081	2.6x6 Phillips, Self-Tapping, Binding Head Screw (Black)	17	

Entire VEGA-RC Twin Unit Exploded View

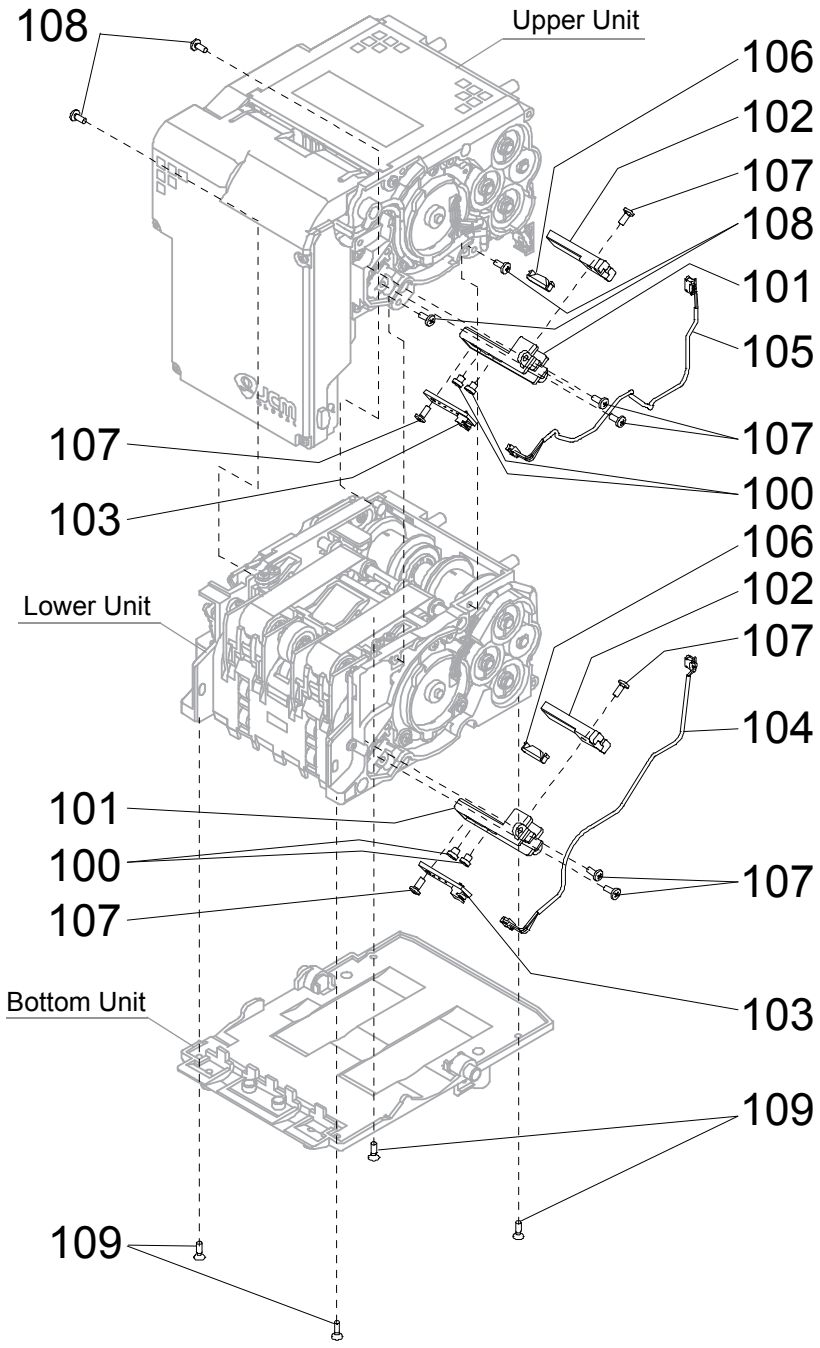


Figure 7-2 Entire VEGA-RC Twin Unit Exploded View

Entire VEGA-RC Twin Unit Parts List

Table 7-2 Entire VEGA-RC Twin Unit Parts List

Ref No.	EDP No.	Description	Qty	Remark
100	216085	LED Holder C2	4	
101	216086	Sensor Holder	2	
102	216087	Prism Holder	2	
103	215614	Sensor Board	2	
104	216719	End1 Harness	1	
105	216720	End2 Harness	1	
106	110909	Prism C	2	
107	104081	2.6x6 Phillips, Self-Tapping, Binding Head Screw (Black)	8	
108	144840	2.6x8 Phillips, Self-Tapping, Binding Head Screw (Black)	4	
109	111124	2.6x8 Phillips, Self-Tapping, Flat Head Screw (Black)	4	

VEGA-RC Twin Upper and Rear Unit Exploded View

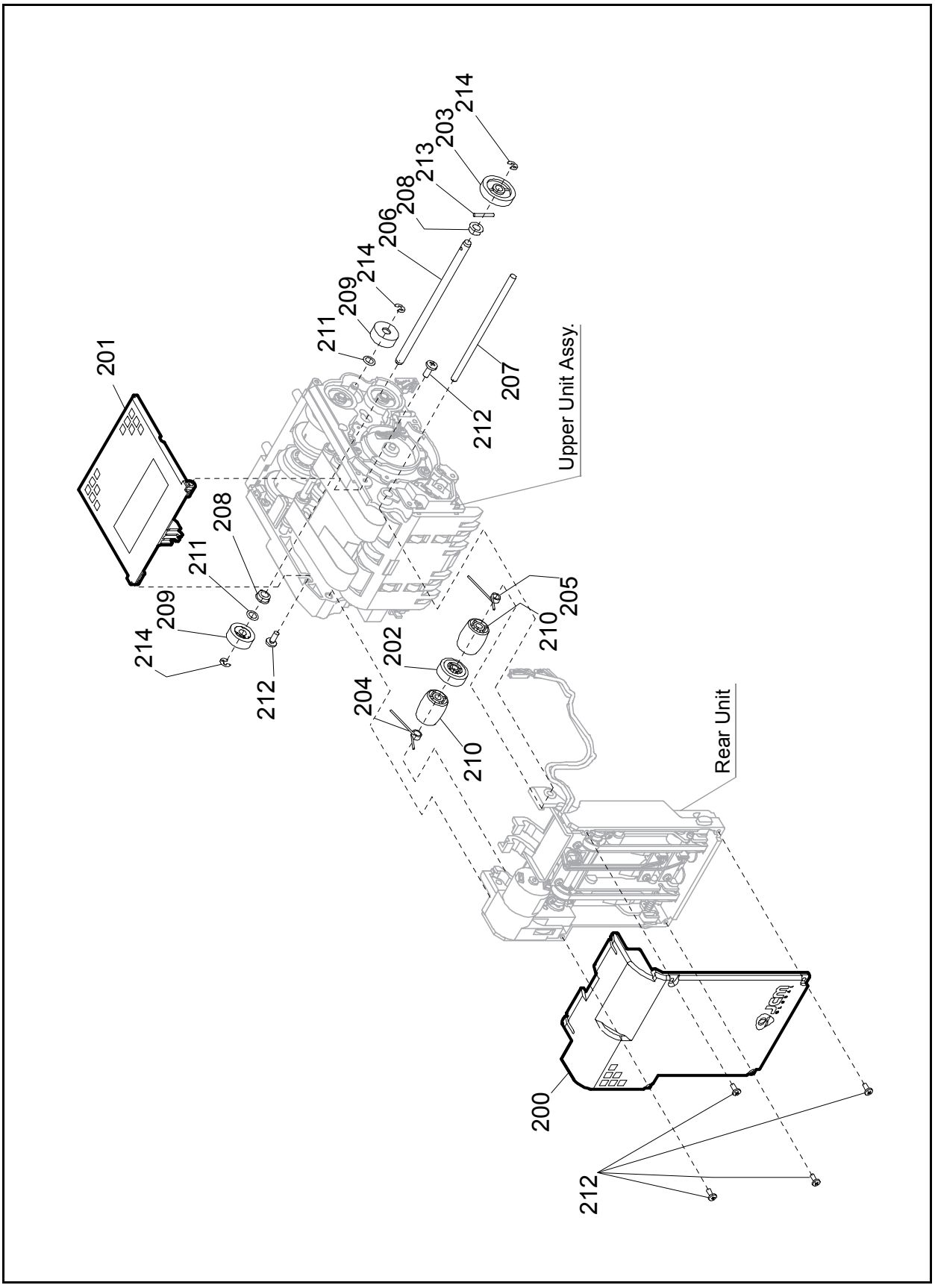


Figure 7-3 VEGA-RC Twin Upper and Rear Unit Exploded View

VEGA-RC Twin Upper and Rear Unit Parts List

Table 7-3 VEGA-RC Twin Upper and Rear Unit Parts List

Ref No.	EDP No.	Description	Qty	Remark
200	236407	Rear Cover	1	
201	216078	Top Cover	1	
202	216164	Sponge Roller	1	
203	216163	Film Bobbin Drive Gear	1	
204	218497	Fulcrum Kick Spring R	1	
205	218496	Fulcrum Kick Spring L	1	
206	216175	Clutch Shaft	1	
207	216178	Axle	1	
208	144584	Bearing	2	
209	144591	Clutch Gear	2	
210	144758	Crown Pulley	2	
211	081188	5x8x0.5 Poly Slider	2	
212	104081	2.6x6 Phillips, Self-Tapping, Binding Head Screw (Black)	6	
213	133880	2x15 Parallel Pin (Hard)	1	
214	091516	Ø3 E-Ring	3	

VEGA-RC Twin Rear Unit Exploded View

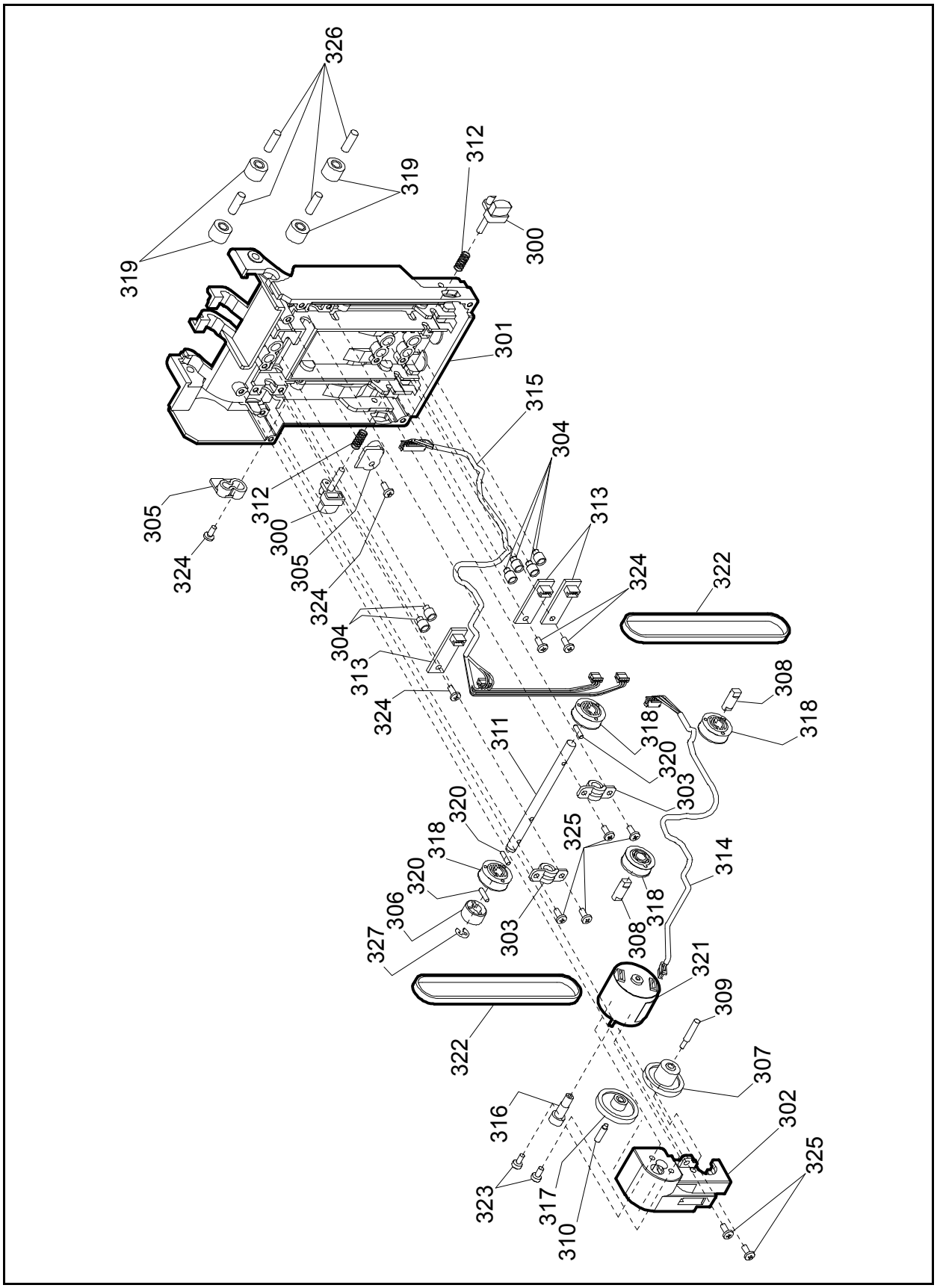


Figure 7-4 VEGA-RC Twin Rear Unit Exploded View

VEGA-RC Twin Rear Unit Parts List

Table 7-4 VEGA-RC Twin Rear Unit Parts List

Ref No.	EDP No.	Description	Qty	Remark
300	216057	Set Latch	2	
301	216060	Rear Course	1	
302	216067	Gear Box	1	
303	216076	Bearing	2	
304	216084	LED Holder C1	6	
305	216088	Multi Plate	2	
306	216159	Drive Gear	1	
307	216161	Idle Gear	1	
308	216169	Idle Axis	2	
309	216170	Gear Axis 18.8	1	
310	216171	Gear Axis 11.1	1	
311	216174	Drive Shaft	1	
312	216154	Latch Coil Spring	2	
313	215613	Entrance Sensor Board	3	
314	216717	Feed Motor Harness	1	
315	216718	Entrance Harness	1	
316	144625	Motor Pinion	1	
317	144631	B Idle Gear 2	1	
318	144602	Drive Pulley 25	4	
319	144600	Support Pulley	4	
320	144612	Set Pin 8	3	
321	215643	DC Brushless Motor	1	
322	217806	Timing Belt	2	
323	003598	M2.6x6 Washer Screw	2	
324	058274	2.6x5 Phillips, Self-Tapping, Binding Head Screw	3	
325	104081	2.6x6 Phillips, Self-Tapping, Binding Head Screw (Black)	8	
326	144844	4x12 Parallel Pin (Hard)	4	
327	091516	Ø3 E-Ring	1	

VEGA-RC Twin Upper Unit Exploded View

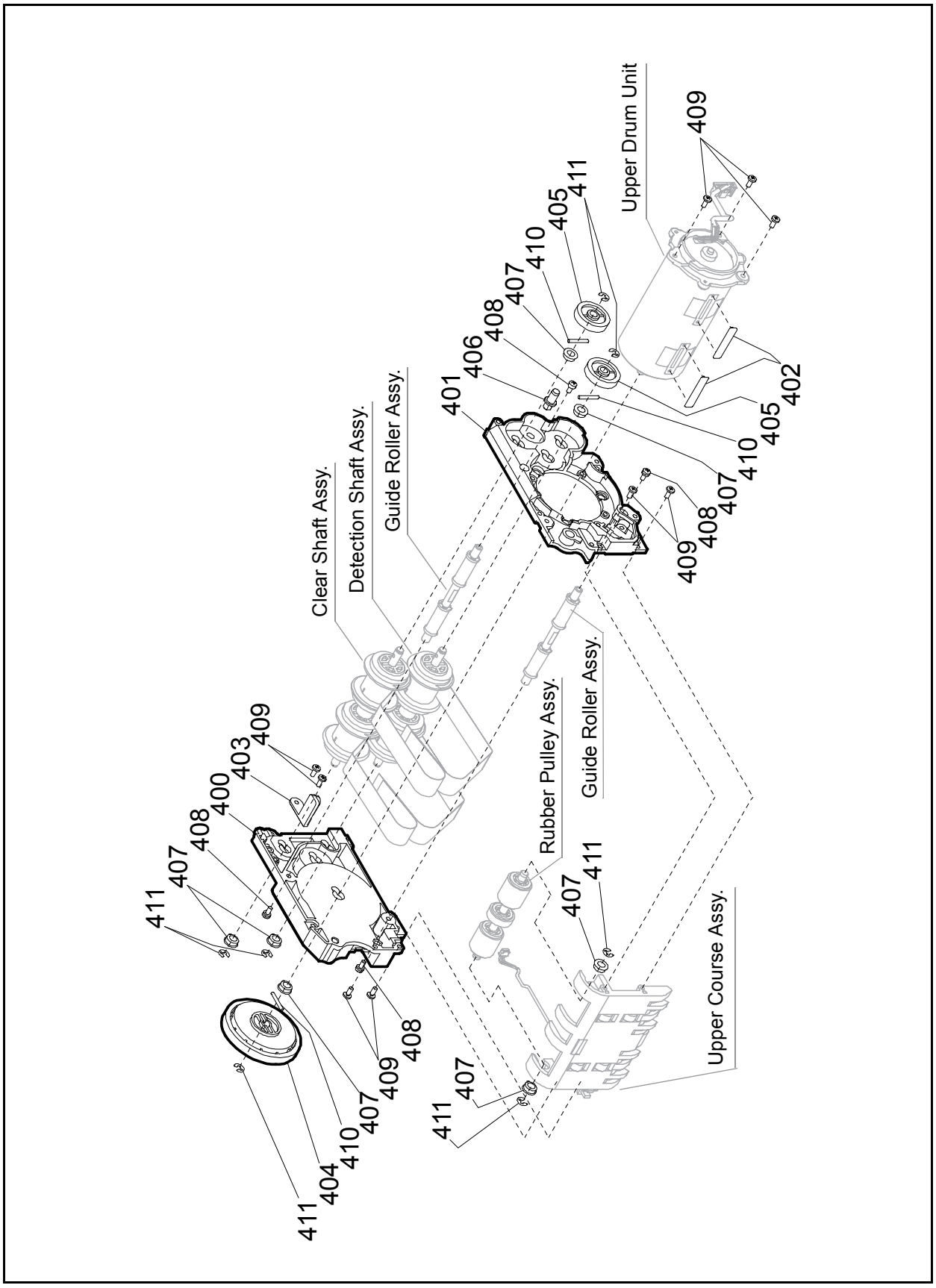


Figure 7-5 VEGA-RC Twin Upper Unit Exploded View

VEGA-RC Twin Upper Unit Parts List

Table 7-5 VEGA-RC Twin Upper Unit Parts List

Ref No.	EDP No.	Description	Qty	Remark
400	216052	Upper Side Frame R	1	
401	216054	Upper Side Frame L	1	
402	216063	Film Set Clip	2	
403	216079	Bobbin Drive Prism	1	
404	216162	Handle Gear	1	
405	216163	Film Bobbin Drive Gear	2	
406	216176	Clutch Axis	1	
407	144584	Bearing	7	
408	005555	M2.6x6 W Washer (Small)	4	
409	104081	2.6x6 Phillips, Self-Tapping, Binding Head Screw (Black)	9	
410	133880	2x15 Parallel Pin (Hard)	3	
411	091516	Ø3 E-Ring	7	

VEGA-RC Twin Lower Unit Exploded View

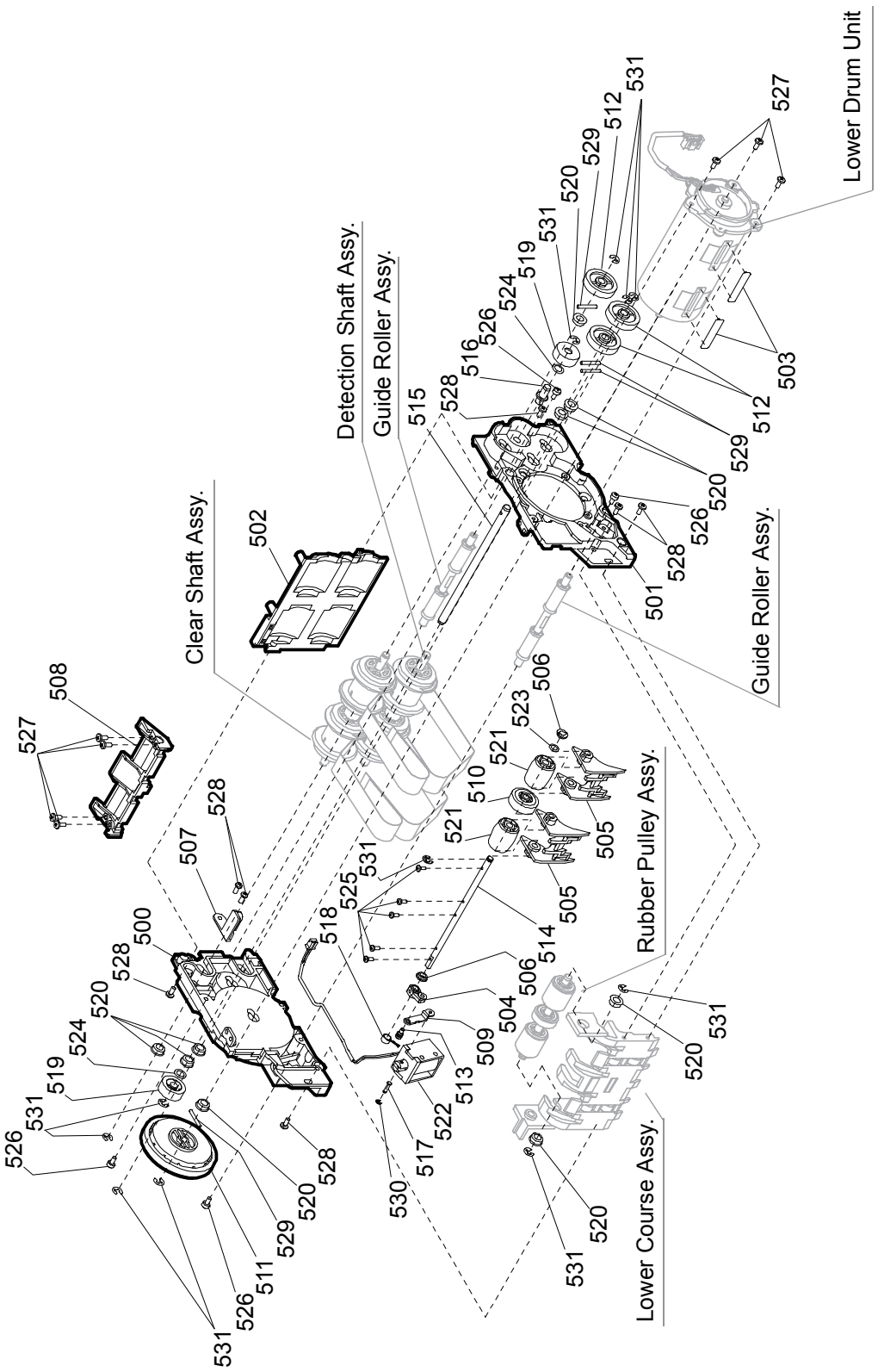


Figure 7-6 VEGA-RC Twin Lower Unit Exploded View

VEGA-RC Twin Lower Unit Parts List

Table 7-6 VEGA-RC Twin Lower Unit Parts List

Ref No.	EDP No.	Description	Qty	Remark
500	216053	Lower Side Frame R	1	
501	216055	Lower Side Frame L	1	
502	216061	Front Frame	1	
503	216063	Film Set Clip	2	
504	216069	Flap Lever	1	
505	216070	Flap	2	
506	216077	Drum Guide Roller	2	
507	216079	Bobbin Drive Prism	1	
508	216089	Guide Course	1	
509	216049	Solenoid Link	1	
510	216164	Sponge Roller	1	
511	216162	Handle Gear	1	
512	216163	Film Bobbin Drive Gear	3	
513	216165	Solenoid Link Pin	1	
514	216168	Main Shaft	1	
515	216175	Clutch Shaft	1	
516	216176	Clutch Axis	1	
517	216180	Solenoid Pin	1	
518	216155	Solenoid Kick Spring	1	
519	144591	Clutch Gear	2	
520	144584	Bearing	9	
521	144758	Crown Pulley	2	
522	216330	Solenoid	1	
523	081297	4x6.5x0.5 Poly Slider	1	
524	081188	5x8x0.5 Poly Slider	2	
525	006011	M2x5 Pan Head Screw	5	
526	005555	M2.6x6 W Washer (Small)	4	
527	104081	2.6x6 Phillips, Self-Tapping, Binding Head Screw (Black)	7	
528	144840	2.6x8 Phillips, Self-Tapping, Binding Head Screw (Black)	7	
529	133880	2x15 Parallel Pin (hard)	4	
530	091518	Ø1.5 E-Ring	1	
531	091516	Ø3 E-Ring	11	

VEGA-RC Twin Upper Course Assembly Exploded View

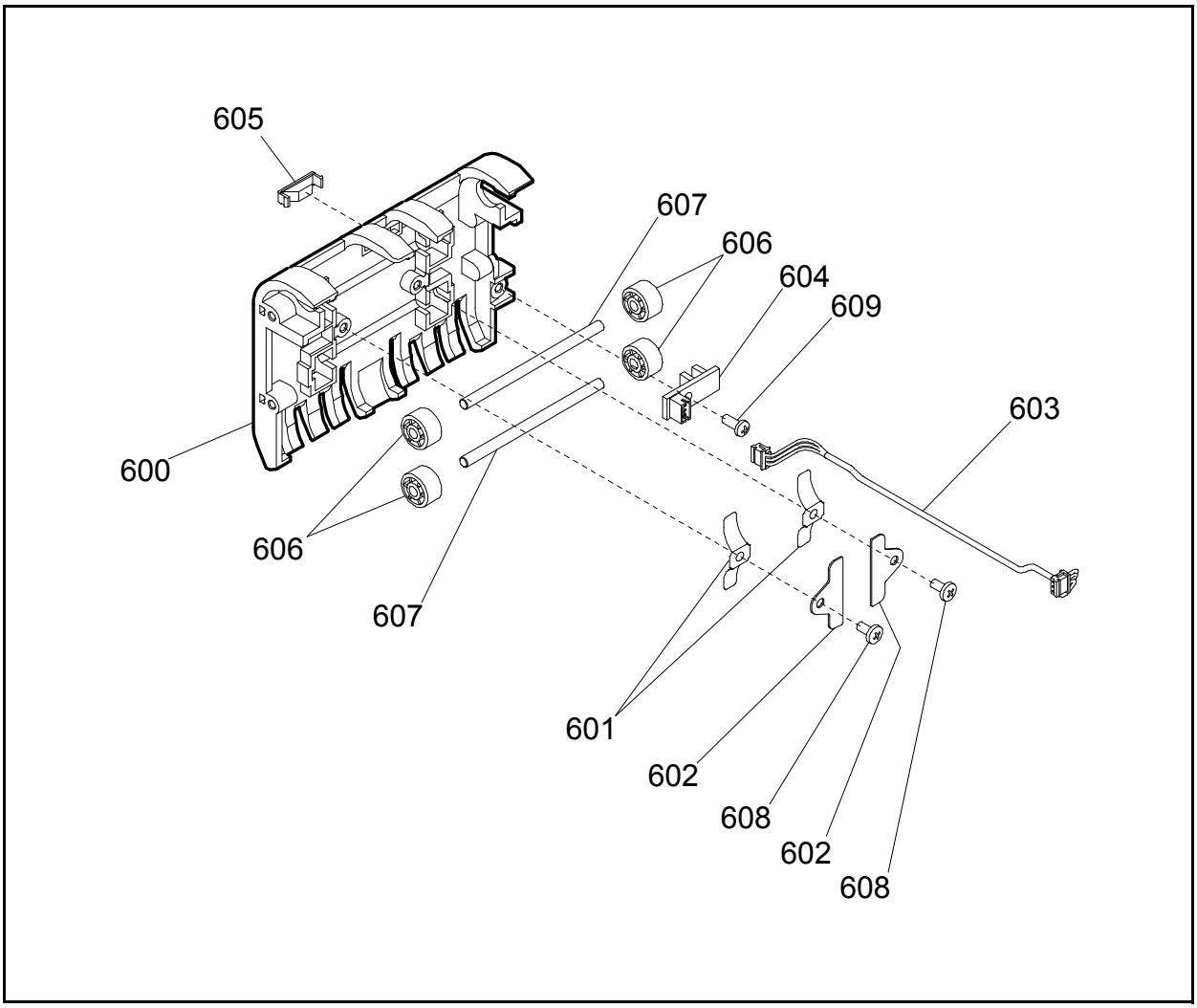


Figure 7-7 VEGA-RC Twin Upper Course Assembly Exploded View

VEGA-RC Twin Upper Course Assembly Parts List

Table 7-7 VEGA-RC Twin Upper Course Assembly Parts List

Ref No.	EDP No.	Description	Qty	Remark
600	216071	Upper Course	1	
601	216048	Leaf Spring 280	2	
602	220271	Axle Guide	2	
603	216721	Door Harness	1	
604	145993	Interrupt Board	1	
605	110909	Prism C	1	
606	144607	Pinch Roller	4	
607	144610	Pinch Roller Shaft	2	
608	058274	2.6x5 Phillips, Self-Tapping, Binding Head Screw	2	
609	104081	2.6x6 Phillips, Self-Tapping, Binding Head Screw (Black)	1	

VEGA-RC Twin Lower Course Assembly Exploded View

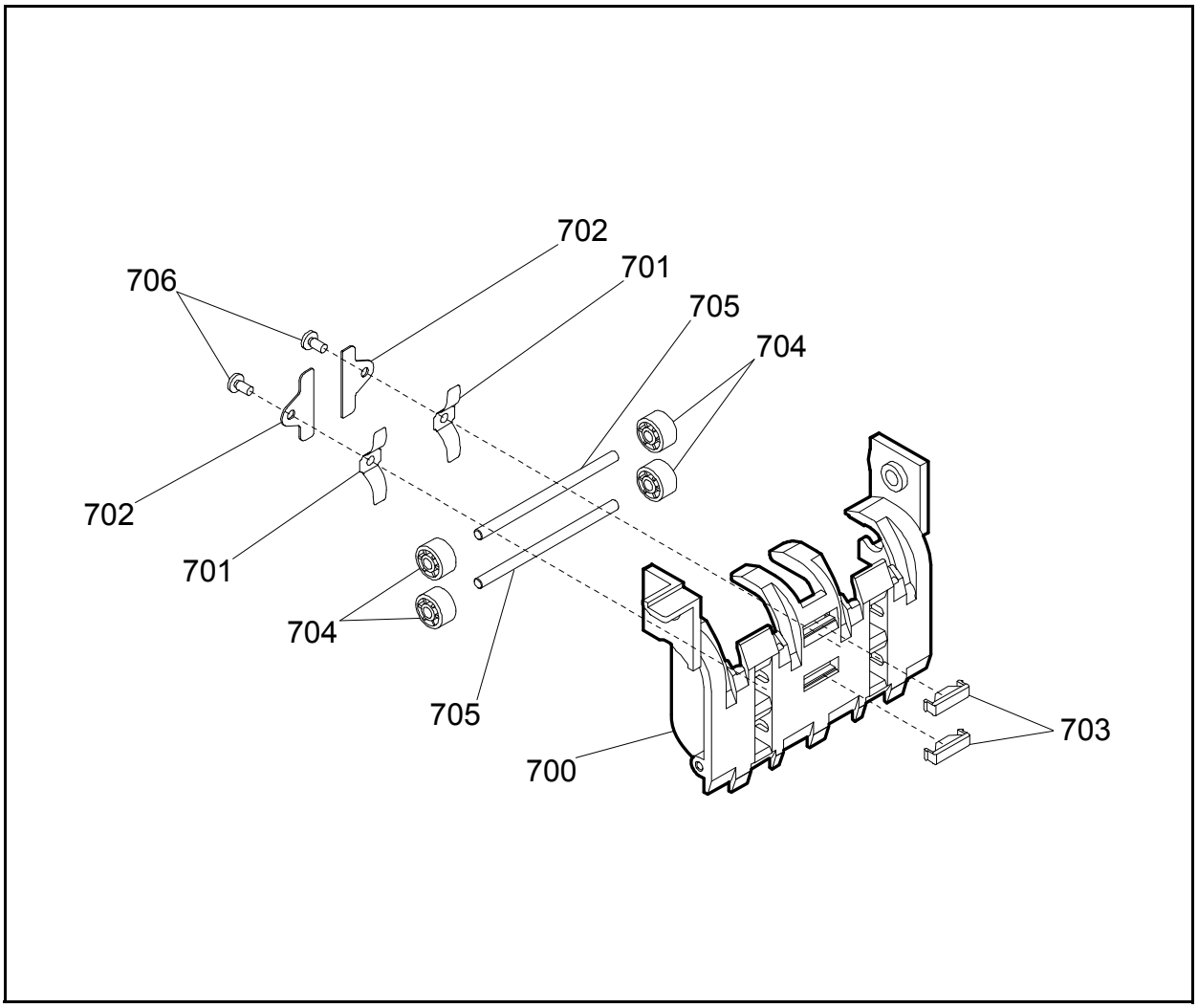


Figure 7-8 VEGA-RC Twin Lower Course Assembly Exploded View

VEGA-RC Twin Lower Course Assembly Parts List

Table 7-8 VEGA-RC Twin Lower Course Assembly Parts List

Ref No.	EDP No.	Description	Qty	Remark
700	216072	Lower Course	1	
701	216048	Leaf Spring 280	2	
702	220271	Axle Guide	2	
703	110909	Prism C	2	
704	144607	Pinch Roller	4	
705	144610	Pinch Roller Shaft	2	
706	203985	2.6x5 Phillips, Self-Tapping, Binding Head Screw (Rammimate)	2	

VEGA-RC Twin Upper and Lower Drum Unit Exploded View

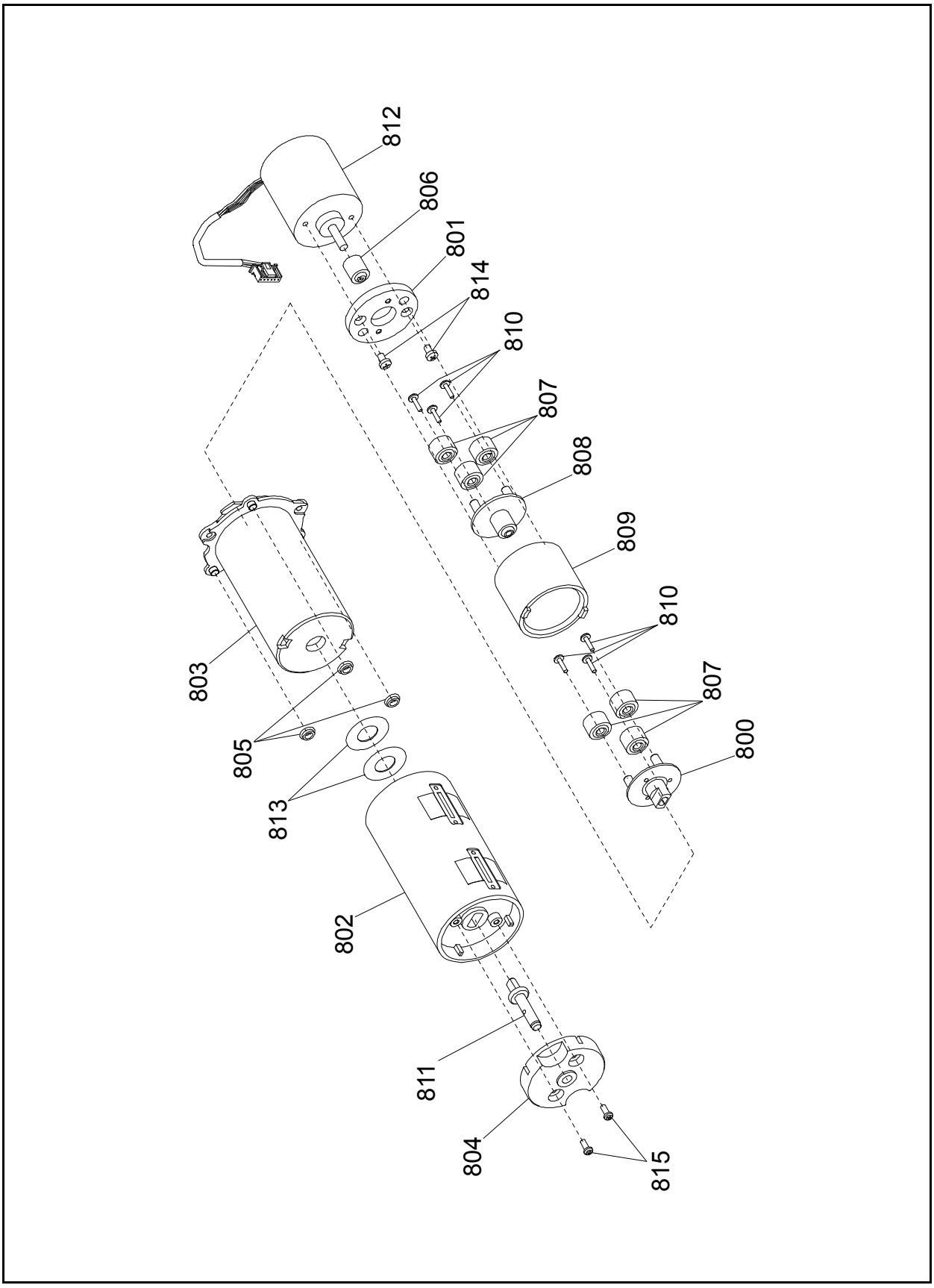


Figure 7-9 VEGA-RC Twin Upper and Lower Drum Unit Exploded View

VEGA-RC Twin Upper and Lower Drum Unit Parts List

Table 7-9 VEGA-RC Twin Upper and Lower Drum Unit Parts List

Ref No.	EDP No.	Description	Qty	Remark
800	216062	Planetary Carrier 2	1	
801	216064	Planetary Base	1	
802	216065	Main Drum	1	
803	216074	Drum Motor Cover	1	
804	216075	Drum Cover	1	
805	216077	Drum Guide Roller	3	
806	216156	Sun Gear	1	
807	216157	Planetary Gear	6	
808	216158	Planetary Carrier	1	
809	216160	Outer Gear	1	
810	216166	Planetary Gear Pin	6	
811	216177	Drum Axis	1	
812	215641	DC Brushless Motor	1	For the Lower Drum
	215642	DC Brushless Motor	1	For the Upper Drum
813	216592	Plain Washer (POM: JURACON®)	2	
814	014840	M3x5 Pan Head Screw	2	
815	104081	2.6x6 Phillips, Self-Tapping, Binding Head Screw (Black)	2	

VEGA-RC Twin Shaft Assembly Exploded View

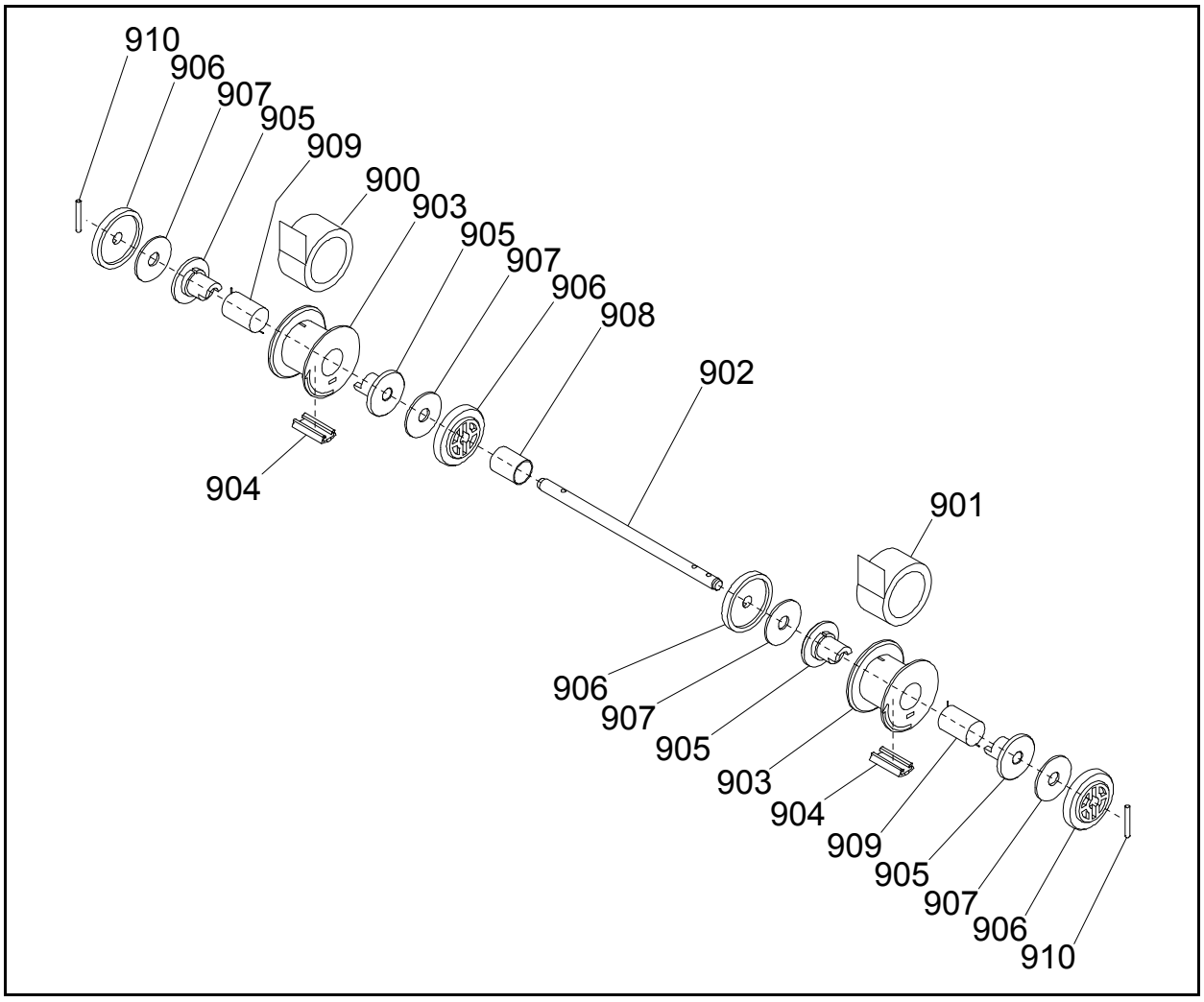


Figure 7-10 VEGA-RC Twin Shaft Assembly Exploded View

VEGA-RC Twin Shaft Assembly Parts List

Table 7-10 VEGA-RC Twin Shaft Assembly Parts List

Ref No.	EDP No.	Description	Qty	Remark
900	216090	Detection Film	1	For the Detection Shaft Assy.
	216091	Clear Film	1	For the Clear Shaft Assy.
901	216091	Clear Film	1	
902	216173	Film Bobbin Shaft	1	
903	144769	Film Bobbin	2	
904	144770	Clip	2	
905	144772	Bobbin Core	4	
906	144773	Bobbin Cap	4	
907	144751	Felt	4	
908	144788	Limit Coil Spring	1	
909	144793	Limit Kick Spring	2	
910	133880	2x15 Parallel Pin (Hard)	2	

VEGA-RC Twin Guide Roller Assembly Exploded View

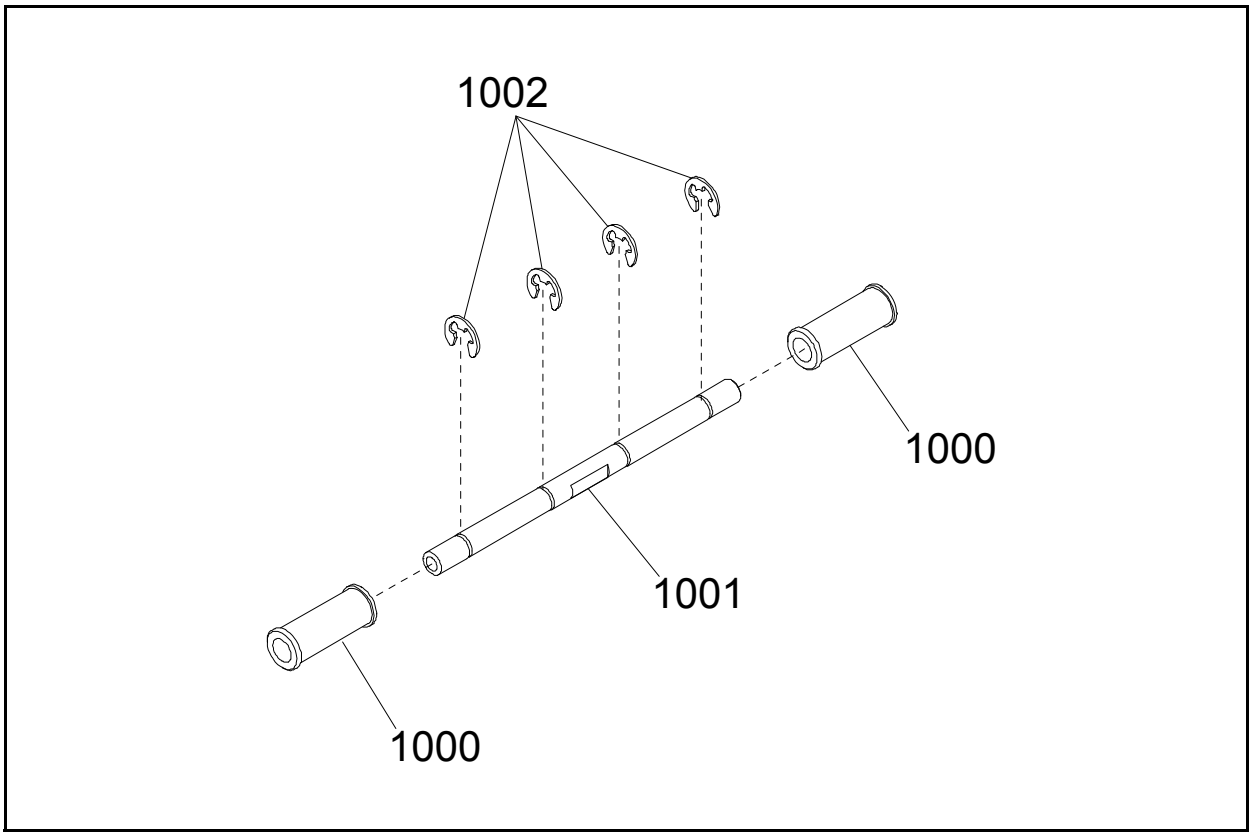


Figure 7-11 VEGA-RC Twin Guide Roller Assembly Exploded View

VEGA-RC Twin Guide Roller Assembly Parts List

Table 7-11 VEGA-RC Twin Guide Roller Assembly Parts List

Ref No.	EDP No.	Description	Qty	Remark
1000	216066	Guide Roller	2	
1001	216167	Roller Beam	1	
1002	091516	Ø3 E-Ring	4	

VEGA-RC Twin Rubber Pulley Assembly Exploded View

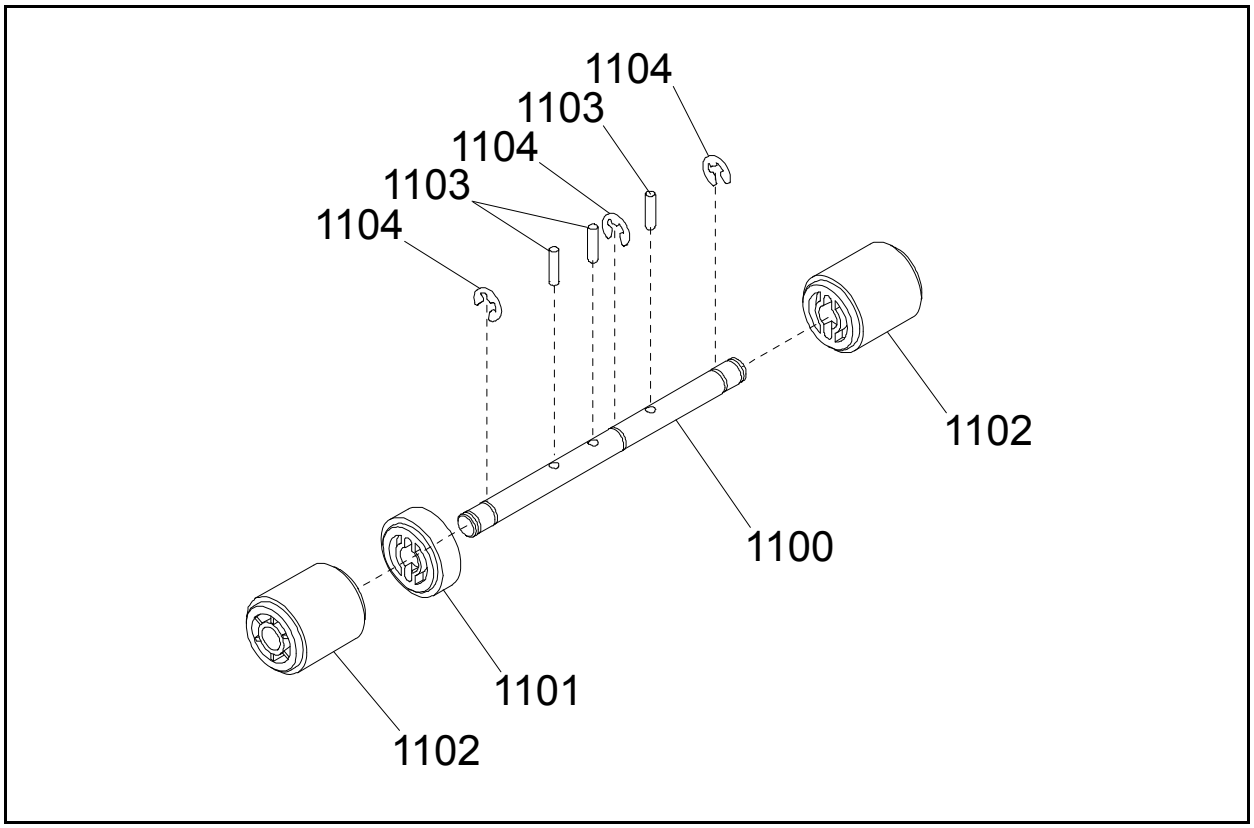


Figure 7-12 VEGA-RC Twin Rubber Pulley Assembly Exploded View

VEGA-RC Twin Rubber Pulley Assembly Parts List

Table 7-12 VEGA-RC Twin Rubber Pulley Assembly Parts List

Ref No.	EDP No.	Description	Qty	Remark
1100	216172	Film Drive Shaft	1	
1101	144752	Drive Roller	1	
1102	205964	Rubber Pulley	2	
1103	144612	Set Pin 8	3	
1104	091516	Ø3 E-Ring	3	

VEGA-RC Twin Bottom Unit Exploded View

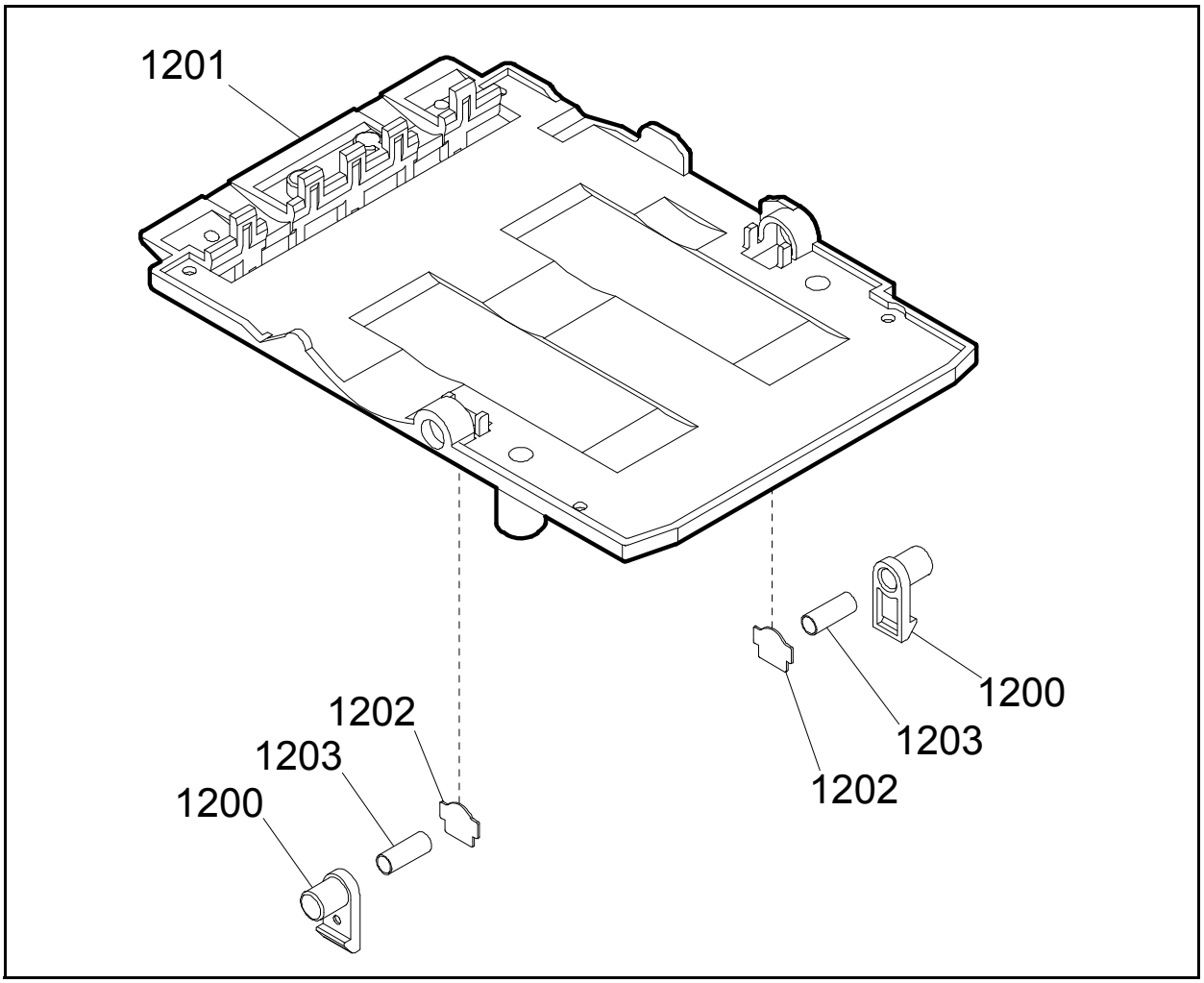


Figure 7-13 VEGA-RC Twin Bottom Unit Exploded View

VEGA-RC Twin Bottom Unit Parts List

Table 7-13 VEGA-RC Twin Bottom Unit Parts List

Ref No.	EDP No.	Description	Qty	Remark
1200	216056	Removal Latch	2	
1201	216073	Bottom	1	
1202	216050	Removal Set P	2	
1203	216154	Latch Coil Spring	2	

VEGA-RC Twin™ Series
Banknote Recycler
Section 8

8 INDEX

THIS PAGE INTENTIONALLY LEFT BLANK

VEGA-RC Twin™ Series
Banknote Recycler
Appendix A

A TROUBLESHOOTING

This section provides troubleshooting instructions for the VEGA-RC Twin™ Series Banknote Recycler Unit, including the following information:

- Introduction
- Troubleshooting Overview
- Fault Table Listings

Introduction

Most Banknote Recycler failures result from minor causes. Before replacing any parts, be sure that all assembly and circuit board connectors are properly fitted, with their harnesses properly connected.

Poor performance by the VEGA-RC Twin Banknote Recycler is often caused when dust or foreign objects adhere to the sensors or transport belt. With power OFF, clean the Banknote insertion section first, then carefully observe the operating state of the Recycler when re-initializing power. This observation is important in locating any causes of failure and the possible fault location.

Perform all repairs by referring to Testing in Section 6, and the Disassembly/Reassembly instructions in Section 4 of this Manual.

Troubleshooting Overview

This product allows the operator to perform fault diagnosis by checking various Fault Table Listings against the symptoms. Survey the cause(s) of any failure occurrences during the process.

After determining the cause of a failure, repair the Unit by replacing any parts that may be necessary. Conduct the Performance Tests, and then perform a VEGA Sensor adjustment to complete the repair.

Fault Table Listings

Table A-1 through Table A-3 list the various possible fault conditions that can occur, and the necessary actions required to correct them. Refer to the LED error indication pattern shown in Figure A-1 to read the Error Codes tables.

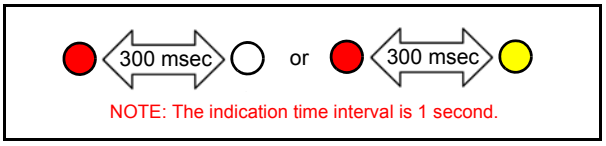


Figure A-1 LED Indication Pattern

Operation Error Codes

The VEGA-RC Twin connected to the VEGA Unit shows an error LED indication or Error Code (when using the option board) anytime an error occurs, such as a Banknote jam inside the unit. Table A-1 lists the Operation Error Codes.

Table A-1 Operation Error Codes

Error Codes	LED Indication (No. of Flashes)	Possible Fault Causes	Corrective Action Required
11	● ○ x 1 Flash	[Restore error] A Banknote remains in the VEGA-RC Twin internal drum when power is reapplied.	Verify that there is no Banknote jam or in-path foreign object. Also, check that assemblies are properly connected and/or harnessed, and all unit sensors are clean. Recovery movement will start automatically after a jammed Banknote is removed.
12	● ○ x 2 Flashes	[Dispense error] A dispensable Banknote remains in the VEGA-RC Twin internal drum when power is reapplied.	
13	● ○ x 3 Flashes	[Retrieving error] A retrievable Banknote remains in the VEGA-RC Twin internal drum when power is reapplied.	
14	● ○ x 4 Flashes	Door is open while the VEGA-RC Twin is operating.	
15	No LED Activity	[Performance inactive] Does not operate, but receives commands from host (display does not appear, but returns a response to a host command.)	
20	● ● x 1 Flash	[Restore error - upper] Banknote jam occurs within the VEGA-RC Twin Unit.	
21	● ● x 2 Flashes	[Restore error - upper] Banknote jam occurs at the VEGA insertion slot.	

Table A-1 Operation Error Codes (Continued)

Error Codes	LED Indication (No. of Flashes)	Possible Fault Causes	Corrective Action Required
23	x 3 Flashes	[Restore error - lower] Banknote jam occurs within the VEGA-RC Twin Unit.	Verify that there is no Banknote jam or in-path foreign object. Also, check that assemblies are properly connected and/or harnessed, and all unit sensors are clean. Recovery movement will start automatically after a jammed Banknote is removed.
24	x 4 Flashes	[Restore error - lower] Banknote jam occurs at the VEGA insertion slot.	
30	x 5 Flashes	[Dispense/Retrieving error - upper] Banknote jam occurs within the VEGA-RC Twin Unit.	
31	x 6 Flashes	[Dispense/Retrieving error - upper] Banknote jam occurs at the VEGA insertion slot.	
35	x 7 Flashes	[Dispense/Retrieving error - lower] Banknote jam occurs within the VEGA-RC Twin Unit.	
36	x 8 Flashes	[Dispense/Retrieving error - lower] Banknote jam occurs at the VEGA insertion slot.	

NOTE: If Banknote Dispensing from the VEGA-RC Twin terminates without warning, the Banknote being processed on the Entrance Sensor, Validation Sensor, Escrow Sensor, RC Flapper Sensor, Stacker-in Sensor or Cash Box Sensor is counted as a "Dispense Completed" Banknote.

NOTE: When a command from the Host machine is received or an electrical power failure occurs before dispensing begins, the Banknote being processed is counted as a "Dispense Completed" Banknote.

Warning Codes

The following Warnings clear automatically after five (5) seconds, but future performance is not guaranteed. For this reason, replacing the CPU Board is recommended.

Table A-2 Warning Codes

Error Codes	LED Indication (No. of Flashes)	Possible Fault Causes	Corrective Action Required
98	x 5 Flashes	Program rewriting time is over limit (more than 1000 occurrences). [Warning issued because program rewriting is limited to 1000 occurrences.]	Change the CPU Board. When program rewriting time exceeds 1000 occurrences, this error code appears for five (5) seconds, and repeats in every instance.
99	x 6 Flashes	EEPROM malfunction. Warning issued if an abnormal EEPROM reading occurs.	Change the CPU Board. When this error occurs, EEPROM data (such as the number of accepted Banknotes, errors, total number of errors, the operation log, dispense times, and serial number) will be lost.

Machine Lock-up Error Codes

When the following errors occur, the unit will stop operating.

Table A-3 Machine Lock-up Error Codes

Error Codes	LED Indication	Possible Fault Causes	Corrective Action Required
01	On	VEGA-RC Twin Motor Abnormality error - the VEGA-RC Twin Upper Brushless Motor is not moving.	Verify that the assemblies are properly connected and/or harnessed, and all of the unit's sensors are clean.
02	On	VEGA-RC Twin Motor Abnormality error - the VEGA-RC Twin Lower Brushless Motor is not moving.	Verify that the assemblies are properly connected and/or harnessed, and all of the unit's sensors are clean.
05	On	Denomination error - Different Banknote denomination (money class) information is received during communication.	Verify that the VEGA-RC Twin stacking denomination matches the VEGA limit's command denomination (confirm that both denomination settings agree).
06	On	VEGA Unit Motor abnormal error. Motor encoder signal not received from VEGA Unit.	Verify that the assemblies are properly connected and/or harnessed, and all of the unit's sensors are clean.

Table A-3 Machine Lock-up Error Codes (Continued)

Error Codes	LED Indication	Possible Fault Causes	Corrective Action Required
07	On	Abnormal INHIBIT information.	The VEGA Unit's denomination setting for the VEGA-RC Twin is inhibited. Verify that the VEGA Unit's denomination settings match the VEGA-RC Twin's denomination settings.
08	On	Using a 24V DC Supply for a 12V DC specification.	Verify that the working voltage is correct for the related Circuit Board.
09	On	Using a 12V DC Supply for a 24V DC specification.	Verify that the working voltage is correct for the related Circuit Board.
10	On	EEPROM writing error - Failed to write data into EEPROM normally.	Change the CPU Board.
16	On	The Brushless Motors for transport are not moving - VEGA-RC Twin Motor abnormality error.	Verify that the assemblies are properly connected and/or harnessed, and all of the unit's sensors are clean.
17	On	VEGA's Flapper is ON when the VEGA-RC Twin "initialization" process is complete.	Power OFF the VEGA Unit and wait one (1) minute, then power it ON again. If the error does not clear, replace the VEGA Unit.

Maintenance Equipment

This section identifies the VEGA-RC Twin Maintenance Equipment.

VEGA RC Twin Maintenance Equipment

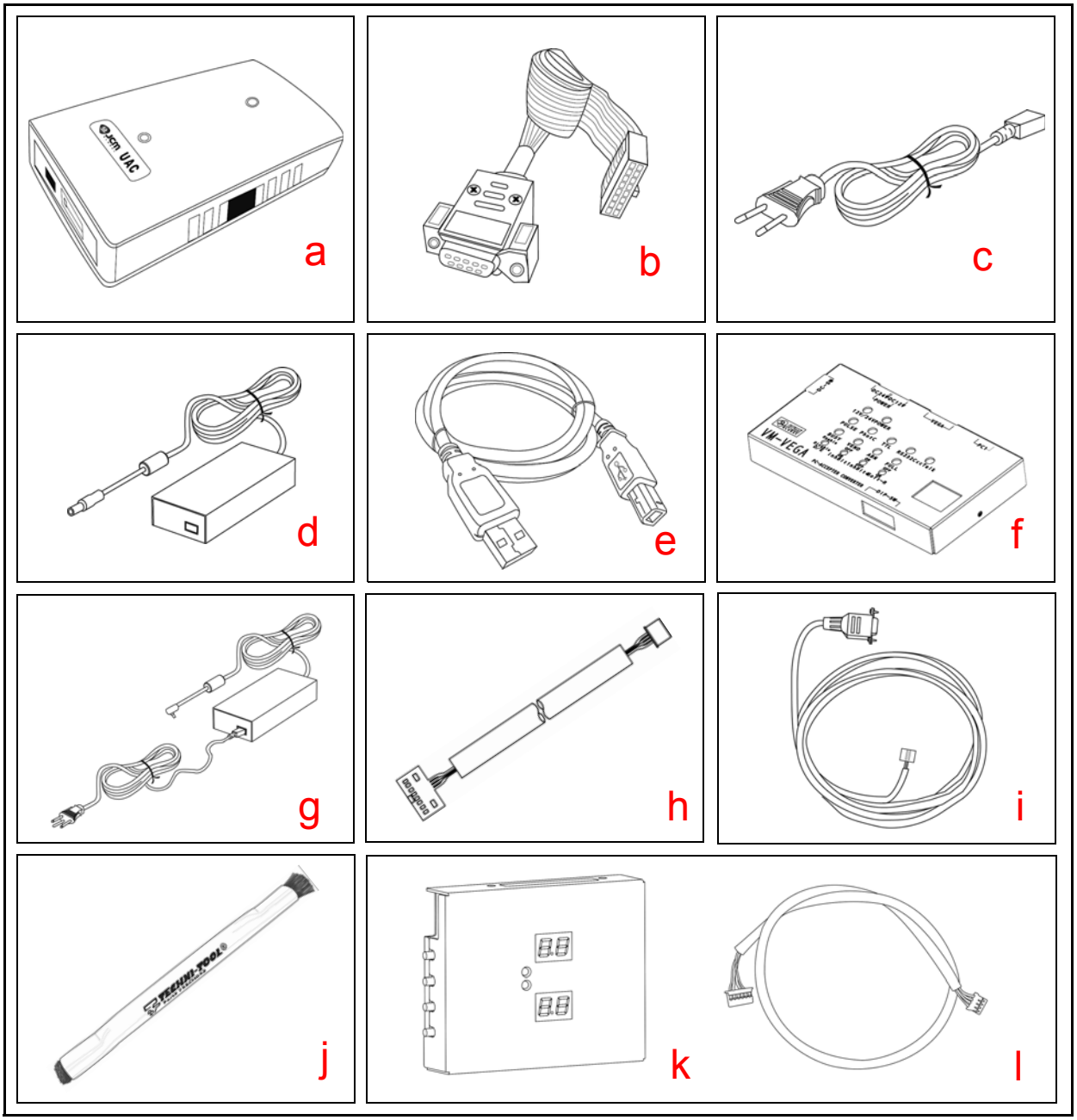


Figure A-2 Maintenance Equipment Requirements

Table A-4 Additional Maintenance Equipment Parts Lists*

	EDP No.	JAC No.	Description	Qty.	Remark
a	G00205	501-100218R	UAC (Universal Acceptor Connector)	1	
b	G00241	400-100669R	UAC Adaptor Harness (ID-003)	1	For UAC
	G00249	← Use G#	UAC Adaptor Harness (ID0E3)	1	
c	G00213	302-100007RA	Power Cord (Euro or USA)	1	
d	G00286	← Use G#	AC Power Adaptor	1	
e	G00230	400-100249R	UAC USB Cable	1	
f	192470	← Use EDP#	VM-VEGA (12V)	1	
	192469	← Use EDP#	VM-VEGA (24V)	1	
g	192467	← Use EDP#	AC Adaptor (12V)	1	For VM-VEGA
	192468	← Use EDP#	AC Adaptor (24V)	1	
h	192460	← Use EDP#	Power Harness	1	
i	049171	← Use EDP#	RS232C I/F Cable	1	
j	N/A	501-00097	Maintenance Brush Tool	1	
k	222239†	← Use EDP#	VM-RC Twin (VM-RC Monitoring Tool)	1	
l	222238‡	← Use EDP#	VM-RC2 Harness (Monitoring Tool Interface Cable)	1	For VM-RC Twin

*. The product that includes a “G” in its EDP Number is a JCM-E product.

†. EDP #222239 VM-RC Twin (VM-RC Monitoring Tool) includes EDP #222238 VM-RC2 Harness (Monitoring Tool Interface Cable).

‡. EDP #222238 VM-RC2 Harness (Monitoring Tool Interface Cable) is available separately.

THIS PAGE INTENTIONALLY LEFT BLANK

B GLOSSARY

A

1 **A/D Value**

An Analog-to-Digital Converter Value (normally expressed in a range from 00 to FF Hexadecimal), which represents the reading obtained from internal Optical Sensors in the VEGA-RC Twin™ during a diagnostic testing mode ...6-4

B

2 **Banknote Jam**

Occasionally, wrinkled or damaged Banknotes may become stuck within the mechanical area of the Recycling Unit, due to acceptance of a severely degraded Banknote or a feed error occurring in the Transport path. Banknote jams may be cleared by following instructions in the Operations and Maintenance Manual ...2-3

C

3 **CPU**

Central Processing Unit. In most systems, the CPU is a multi-pin semiconductor device mounted on a Printed Circuit Board (PCB). The CPU is used in conjunction with other interface microchips and memory devices, and controls the overall operation of the equipment into which it is installed ...A-2

D

4 **DIP Switch**

Dual Inline Package Switch. A mountable two-position slide switch containing up to 16 individual switches per block assembly mounted on a Printed Circuit Board (PCB). DIP Switches (which may be set to “ON” or “OFF” position) are often used in circuits where manual selection of operational changes, options and features is desired ...6-1

5 **Drum**

The Banknote storage area within the Recycler ...1-3

E

6 **EEPROM**

Electronically Erasable Programmable Read Only Memory. A form of non-volatile Read Only Memory (ROM) that can be written to and erased via electronic signals without being removed from its Circuit Board housing. EEPROMs are often used to store system command instructions and reference data sets that are accessed frequently, or when the equipment is first powered up ...A-2

7 **Encoder Signal**

A signal from a small Printed Circuit Board (PCB) located inside the Recycler Unit, containing an optical sensor used to detect rotation of the Transport Motor Shaft Encoder. The output signal is sent to the CPU Board and translated to determine the speed of the Transport Motor ...A-2

8 **E-Ring**

An “E”-shaped semicircular clip designed to fit onto a shaft groove to retain a component, or to keep the shaft in place ...4-6

F

9 **Film/Film2**

Transparent Plastic (Celluloid) Films located inside the Recycler Unit, used for transporting Banknotes into and out of the VEGA-RC Twin™ internal Drums ...4-1

10 **Flapper Sensor**

An optical sensor located on the VEGA™ Upper CPU Circuit Board Assembly, which detects movement of the Stacker Flap at the rear of the VEGA™ Banknote Validator’s Transport Assembly. The position of the Stacker Flap determines whether the Banknote being validated will be sent to the VEGA™ Cash Box or to the VEGA-RC Twin™ Recycler Drum ...6-4

H

11 **Host Machine**

A generic term for any electronic cabinet, equipment or platform where a VEGA-RC Twin™ Banknote Recycler will be installed. The Host Machine supplies both the power and the communications interface necessary for proper operation of the VEGA-RC Twin™ Unit ...1-2

L

12 **LED**

Light-Emitting Diode, a semiconductor device available in a variety of colors when turned on, it emits a signal output in the visible light range. LEDs are cost-effective, and commonly used as indicator lights in a variety of equipment. They are also available in the invisible light range (e.g., ultra-violet, near-infrared), and useful in a variety of electronic equipment and applications, such as Banknote validation circuitry ...1-4

13 **Log**

an archived record of Banknote transactions processed by the Validator. Logged Data is stored in memory, and is available for viewing on request. Logged information usually includes the number of Banknotes accepted or rejected, its denomination, which direction the Banknote was inserted into the Unit, the number of times a Banknote was rejected, and Error Codes occurring during the validation and/or stacking process ...A-2

M

14 **MDB**

Multi Drop Bus. In the automated vending industry, MDB is a serial interface standard/ communications data protocol commonly used for communications between a Vending Machine Controller (VMC) and installed peripherals, such as Banknote Validators and Coin Changers. MDB compatibility is a featured option in the VEGA-RC Twin™ ...1-2

15 **Money Class**

An alternate term for a Banknote's denomination. The range of denominations accepted by the VEGA™ or VEGA-RC Twin™ is determined by the current Firmware load installed in memory, and as specified on the applicable Software Information Sheet. On the VEGA-RC Twin™, the user has the option to specify which Banknote denomination is to be stacked to the Recycler ...A-2

P

16 **Pictograph**

Small, internationally-recognized safety and attention symbols placed to the left of Notes, Cautions and Warnings throughout a JCM Maintenance Manual ...1-1

17 **Precautions**

Special instructions and warnings that appear in JCM Maintenance Manuals. They are intended to promote personal safety and prevent damage to equipment when working with the applicable JCM Product ...1-2

R

18 **Recycler**

The VEGA-RC Twin™, an optional add-on device for the VEGA™ Banknote Validator. The Recycler adds additional capability and functionality to the VEGA™ Unit by stacking, storing, and recycling Banknotes back to the customer on demand. These features are particularly useful during cash transactions and vending operations ...1-1

S

19 **Sensor**

A photo sensitive device and LED combination designed to detect timing and movement events within a Validation Device ...1-2

20 **Special Notes**

Notation within JCM Maintenance Manuals that alerts the reader to specific information that can affect operation of the Unit. Notations often appear throughout the manual, and are identified by the pictograph icon. Special Notes are always written in italic text ...1-1

T

21 **The Seven Segment Display**

A chip package that displays alphanumeric data from program control by lighting various combinations of segments to form user-recognized letters and numbers. For the VEGA-RC Twin™ Unit, two (2) Seven Segment LED Semiconductor Chip Packages located on the face of the Monitoring Tool CPU Board indicate operational status and diagnostic test information ...6-3

22 **Timing Belt**

Rubberized belts used to transport Banknotes inside the Recycler ...4-1

V

23 **Validator**

Electronic equipment that accepts and validates the authenticity of Banknotes used in automated cash transactions and vending operations. Validation involves evaluating data received from magnetic sensors, optical sensors, or a combination of both. Validation techniques are constantly being improved to thwart counterfeiters. Newer validation technologies employ CMOS photo-imaging sensors to obtain even greater accuracy and security. JCM Global is a ...6-3

24 **VEGA**

A new state-of-the-art Banknote Validator offered by JCM Global. The combination Banknote Acceptor and optional VEGA-RC Twin™ Recycling Unit makes VEGA™ an attractive choice for AWP (Amusement with Prize), Vending, and Payment Terminal Markets ...1-2

25 **VEGA-RC Twin**

A Banknote Recycler Unit option used in conjunction with the VEGA™ Unit. The VEGA-RC Twin™ can be programmed to accept and recycle any Banknote denomination within a defined set of country currency values, and works with payment processing and vending systems to pay out Banknotes to a customer as a result of cash transactions initiated by a Host System ...1-1

Issue #4094-SME-01-02